Service Instructions

Condensing gas boiler

WARNING!
Improper installation, adjustment, alteration, service or maintenance can cause injury, loss of life or property damage. Refer to this manual. For assistance or additional information consult a qualified installer, service agency or the gas supplier.

NOTICE!
In the Commonwealth of Massachusetts this boiler must be installed by a licensed Plumber or Gas Fitter.

Warning: If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- **Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.**
- **What to do if you smell gas**
  - **Do not try to light any boiler.**
  - **Do not touch any electrical switch; do not use any phone in your building.**
  - **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**
  - **If you cannot reach your gas supplier, call the fire department.**
- **Installation and service must be performed by a qualified installer, service agency or the gas supplier.**

Notice:

- This manual is available in the English and French language.
- This manual must be retained for future reference.

Logamax plus GB162-80 kW/100 kW

For the contractor

Please read these instructions carefully before servicing!

6 720 614 965 (11/2012) US/CA

Buderus

section 1 Product description

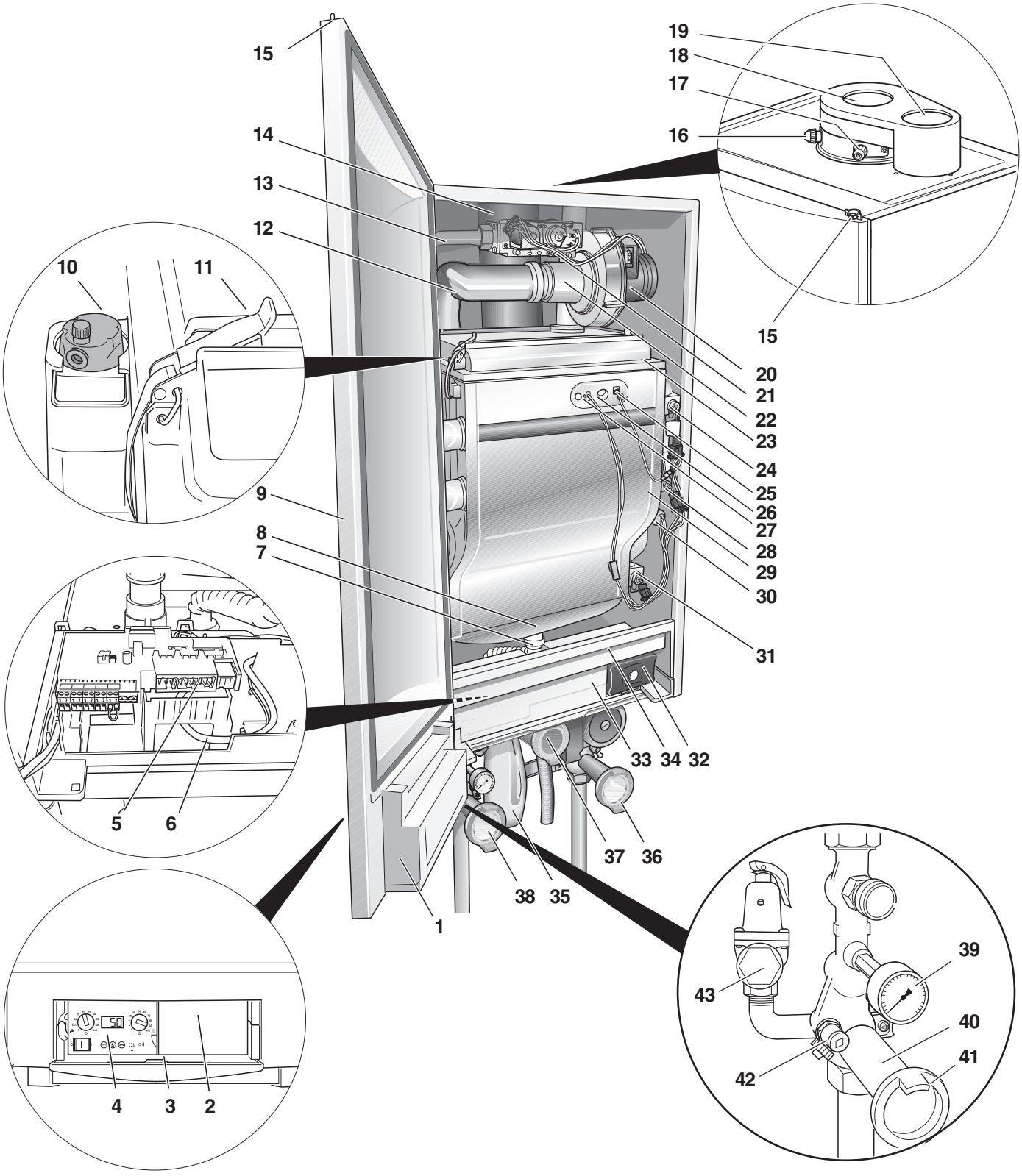


Fig. 1 Logamax plus GB162 with pump group

section 2 Legend

1: BC10 basic controller receptacle
2: Installation option for room controller, e.g. RC35
3: Cover with user manual compartment
4: BC10 basic controller, can be expanded e.g. by the RC35 room controller
5: Connection box (low-voltage and 120 VAC connections)
6: Fan harness and mains lead of the pump
7: Condensate drain outlet
8: Condensate collector
9: Boiler front door
10: Automatic air vent
11: Retaining clips
12: Air intake for the fan
13: Gas pipe
14: Flue gas pipe
15: Door lock
16: Flue measuring point
17: Measuring point for air intake
18: Flue gas connection
19: Air intake connection
20: Fan
21: Gas valve
22: Venturi
23: Burner cover
24: Flow temperature sensor
25: Ionization electrode
26: Sight glass
27: Glow ignitor
28: Safety temperature sensor
29: Heat exchanger
30: Pressure sensor
31: Return temperature sensor
32: Universal Burner Automatic Version 3 (UBA 3)
33: Drawer with function module integration options
34: Cover shield
35: Condensate trap

Pump group (scope of delivery):

36: Isolating valve, blue (CH boiler return) with pump, drain valve, check valve and thermometer
37: Manual gas shutoff valve, yellow (GAS)
38: Isolating valve, red (CH boiler supply) with drain valve, pressure gauge, thermometer and pressure relief valve
39: Pressure gauge
40: Isolating valve
41: Thermometer (optional accessory)
42: Drain valve
43: Pressure relief valve 30 PSI (2 bar) (or 50 PSI [3.45 bar] = optional)

The pump group also includes an insulation cover (see also pump group installation instructions).

Low loss header (scope of delivery, single appliance only)

44: Low loss header (not illustrated)

section 3 Contents

Section **page**

Product description 2

1 General 5
General information 5
Layout of this document 5
Remedying faults using this document 6
Logamax plus GB162 6

2 Safety and general instructions 7
Safety and general instructions 7

3 Regulations and guidelines 9
General regulations 9
Regulations in Massachusetts 9

4 Operation 10
General 10
Menu structure 12
Normal Operation menu 13
Flue Gas Test menu 13
Service Mode menu 14
Manual Operation menu 15
Settings menu 15
Operation 17

5 Symptoms 21
Symptoms 21
Removing the control panel 21
Display readings 21
Display settings 21
Display codes and other symptoms 21

6 Diagnosis 30
Diagnosis 30

7 Actions 56
Hanging the control panel from the boiler 56
Shutting down 56
Switching off main power 56
Closing cover of the BC10 57
Switching off power supply 57
Opening boiler door 57
Closing isolating valves 57
Draining the system 57
Opening isolating valves 58
Closing boiler door 58
Filling and bleeding the system 58
Switch on power supply 59
Switching on main power 59
Initial startup 60
Checking/replacing fuses 61
Checking the fan unit; operation (120 VAC) 61
Checking the fan unit; power supply cord (120 VAC) 62
Checking the fan unit; tacho cable 62
Checking and/or replacing the fan unit 63
Checking the pump; mechanical obstruction 64
Checking the pump; activation 65
Checking the pump; power supply cord 65
Checking the pump; tacho cable 66
Checking the pump; pollution 67
Replacing the pump 67
Checking the supply, safety, return and DHW temperature sensors 68
Checking the supply, safety, return and DHW temperature sensors; cables 69
Replacing the feed, safety and return sensors 71
Replacing the DHW temperature sensor 72

Section **page**

Checking the flue gas sensor 72
Checking the flue gas sensor; cable 73
Replacing the flue gas sensor 74
Checking the glow ignitor; activation 74
Checking the glow ignitor; resistance 75
Checking the glow ignitor; power supply cord 75
Replacing the ignition unit 76
Measure the ionization current 76
Checking the ionization electrode; short circuit 77
Checking the ionization electrode; cable 78
Checking the ionization electrode 78
Checking the ionization circuit; ground lead 79
Checking the gas valve; power supply plug 79
Checking the gas valve; activation 79
Checking the gas valve; electrical resistance of the power supply cord 80
Checking the gas valve; internal electrical resistance 80
Replacing the gas valve 81
Checking the ON/OFF controller 82
Checking the RC regulator 82
Checking an external switch contact 83
Measuring the difference between the static and dynamic gas supply pressures 83
Bleeding the gas supply pipe 84
Measuring and adjusting the gas/air ratio 84
Checking the transformer; internal electrical resistance 85
Checking the transformer; power supply cord and low-voltage cord 86
Replace transformer 86
Checking the wire harness; connections 87
Checking the cotrol panel; supply voltage 87
Replacing the automatic air purging system 88
Replacing/cleaning the burner 88
Replacing/cleaning the siphon 89
Checking/replacing the pressure sensor; pollution 89
Replacing/cleaning the heat exchanger 89
Replacing the UBA 3 91

8 Appendix 92
Electrical wiring diagram 92
Legend of electrical wiring diagram 93
Power rating 93
Sensor resistance readings 93
Technical Specifications of GB162-boilers at sea level (0-4,000 ft) 94
Spare parts list 96
Spare parts list (continued) 96
Exploded view Logamax plus GB162-80 kW/100 kW 97
Exploded view pump group Logamax plus GB162-80 kW/100 kW . 98

section 4 General information

About these instructions

These servicing instructions contain important information for the safe and professional servicing of the boiler with boiler input rating of 80 kW and 100 kW.

The name of the boiler is made up of the following components:

– **Logamax plus**: heating boiler typical
– **GB162**: single boiler without domestic hot water supply
– **80 kW/100 kW**: maximum heating capacity is 80 or 100 kW.

GB162	Natural Gas	Propane Gas
80 kW	290,000 btu/hr	270,000 btu/hr
100 kW	333,000 btu/hr	315,000 btu/hr

Table 1 max. input rate

These servicing instructions are intended for professional installers, who have the necessary training and experience for working on heating and gas systems.

Cascade installation

Special cascade units (accessories) have been developed to enable this boiler to be installed in a cascade system. Every cascade unit includes an installation frame, horizontal headers, connection pipes for the boiler, main gas pipe and a vertical low loss header.

Cascade units are available for installing the boilers inline or back-to-back. These cascade units make installing a cascade system easier and less labor intensive.
Please contact Buderus for further information about cascade systems.

Updating of documentation

The following technical documentation is available for the Logamax plus GB162-80 kW/100 kW:

– Installation Instructions
– User's Manual
– Service Instructions.

Please contact us if you have any suggestions for improvement or corrections.

Subject to technical modifications

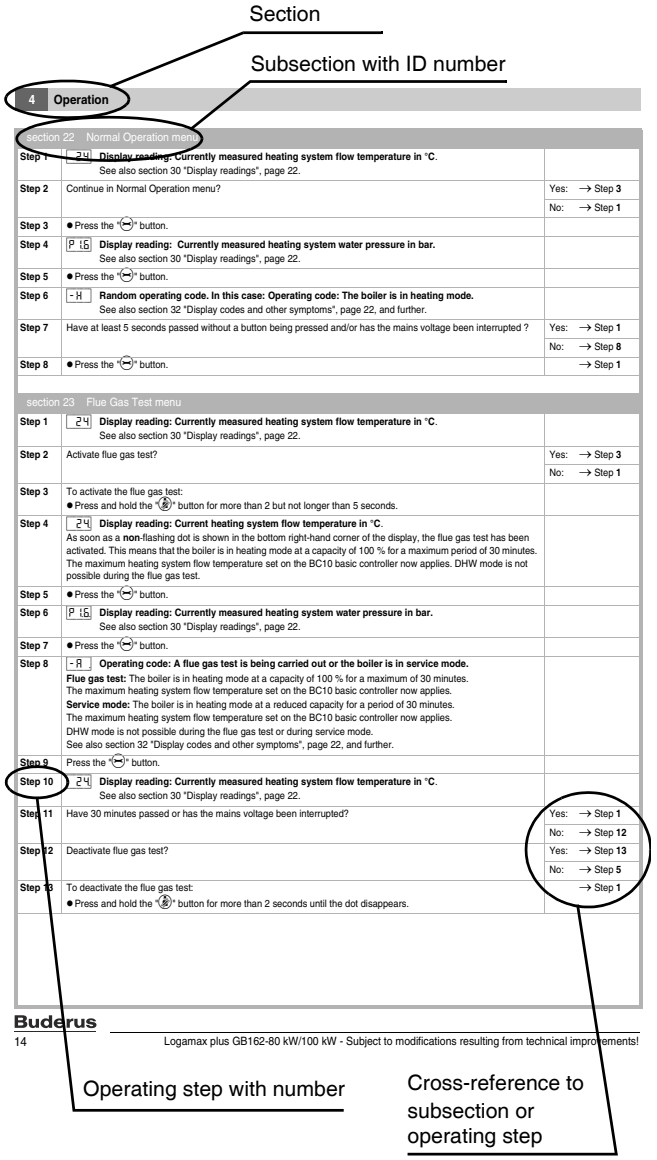
Slight changes may be made without prior notice to the illustrations, process steps and technical data as a result of our policy of continuous improvement.

section 5 Layout of this document

This document consists of various **sections**. They have been divided into **subsections**.

Every subsection is marked with a grey frame. An ID number is always provided in the top left-hand corner. References in the document are based on these ID numbers.

In addition, a subsection may be divided into various numbered **operating steps**. Reference to a certain operating step is always made within the same subsection. If an operating step involves the taking of a yes/no decision, the right-hand side of the table indicates which **operating step** or **subsection** you should proceed with (cross-reference).


Section
Subsection with ID number
4 Operation
section 22 Normal Operation menu
Step 1 24 Display reading: Currently measured heating system flow temperature in °C. See also section 30 "Display readings", page 22.
Step 2 Continue in Normal Operation menu? Yes: → Step 3 No: → Step 1
Step 3 ● Press the "⊖" button.
Step 4 P 1.6 Display reading: Currently measured heating system water pressure in bar. See also section 30 "Display readings", page 22.
Step 5 ● Press the "⊖" button.
Step 6 -H Random operating code. In this case: Operating code: The boiler is in heating mode. See also section 32 "Display codes and other symptoms", page 22, and further.
Step 7 Have at least 5 seconds passed without a button being pressed and/or has the mains voltage been interrupted ? Yes: → Step 1 No: → Step 8
Step 8 ● Press the "⊖" button. → Step 1
section 23 Flue Gas Test menu
Step 1 24 Display reading: Currently measured heating system flow temperature in °C. See also section 30 "Display readings", page 22.
Step 2 Activate flue gas test? Yes: → Step 3 No: → Step 1
Step 3 To activate the flue gas test: ● Press and hold the "⊛" button for more than 2 but not longer than 5 seconds.
Step 4 24 Display reading: Current heating system flow temperature in °C. As soon as a non-flashing dot is shown in the bottom right-hand corner of the display, the flue gas test has been activated. This means that the boiler is in heating mode at a capacity of 100 % for a maximum period of 30 minutes. The maximum heating system flow temperature set on the BC10 basic controller now applies. DHW mode is not possible during the flue gas test.
Step 5 ● Press the "⊖" button.
Step 6 P 1.6 Display reading: Currently measured heating system water pressure in bar. See also section 30 "Display readings", page 22.
Step 7 ● Press the "⊖" button.
Step 8 -A Operating code: A flue gas test is being carried out or the boiler is in service mode. Flue gas test: The boiler is in heating mode at a capacity of 100 % for a maximum of 30 minutes. The maximum heating system flow temperature set on the BC10 basic controller now applies. Service mode: The boiler is in heating mode at a reduced capacity for a period of 30 minutes. The maximum heating system flow temperature set on the BC10 basic controller now applies. DHW mode is not possible during the flue gas test or during service mode. See also section 32 "Display codes and other symptoms", page 22, and further.
Step 9 Press the "⊖" button.
Step 10 24 Display reading: Currently measured heating system flow temperature in °C. See also section 30 "Display readings", page 22.
Step 11 Have 30 minutes passed or has the mains voltage been interrupted? Yes: → Step 1 No: → Step 12
Step 12 Deactivate flue gas test? Yes: → Step 13 No: → Step 5
Step 13 To deactivate the flue gas test: ● Press and hold the "⊛" button for more than 2 seconds until the dot disappears. → Step 1
Buderus
14 Logamax plus GB162-80 kW/100 kW - Subject to modifications resulting from technical improvements!
Operating step with number
Cross-reference to subsection or operating step

section 6 Remedying faults using this document

FAULTS CAN BE REMEDIED USING THIS DOCUMENT, BY FOLLOWING A 3-STEP PLAN. IT IS IMPORTANT THAT THE SAME SEQUENCE IS FOLLOWED EVERY TIME.

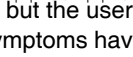
Step 1: Symptoms

Step 2: Diagnosis

Step 3: Action

Step 1: chapter 5 Symptoms

Symptom = every indication which may be relevant in order to recognize faults or errors.

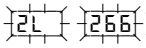
An important symptom is the display indication on the BC10 basic controller of the boiler, but all other symptoms must also be taken into consideration. In most cases, the display indication (e.g. the locking fault code ) can easily be read from the BC10 basic controller, but the user of the boiler must also be asked whether other symptoms have occurred. Examples of such symptoms are "the boiler makes whistling noises in the morning" or "the room does not reach the required temperature". The display indications and their meanings as well as other symptoms are described in section 29 "Display codes and other symptoms" on page 21.

There are three types of display indication:

– display reading (section 27 "Display readings" on page 21)
– display setting (section 28 "Display settings" on page 21)
– display code (section 29 "Display codes and other symptoms" on page 21).

There are three types of display code:

– operating code
  This code gives the status of the boiler. No action is necessary.
– blocking fault code
  The boiler is locked and will only restart after a manual reset. The pump will operate continuously for frost protection.
– locking fault code
  The boiler resumes normal operation when the fault has cleared.

Every display code (e.g. the locking fault code ) consists of:

– a main code (in this case)
– a subcode (in this case).

After reading the main code, the subcode can be called up by pressing the service key.

Step 2: chapter 6 Diagnosis

Diagnosis = establishing the cause of the fault or error on the basis of the symptoms.

A diagnosis (chapter 6 "Diagnosis" on page 30) can be made after determining all symptoms.

The right-hand column of the symptoms overview (section 5 "Symptoms" on page 21) refers to the corresponding diagnosis box. The diagnosis box can be used next to easily find the cause of the fault.

Step 3: chapter 7 Actions

Action = remedying the cause of the fault or error.

After laying down the diagnosis, the fault can be remedied by means of chapter 7 "Actions" on page 56.

section 7 Logamax plus GB162

The **Logamax plus GB162** condensing gas boiler is a fully up-to-date central heating boiler, designed to provide a high level of convenience, maximum energy savings, optimum care for the environment and advanced safety features – all in a single device.

This is why the boiler is equipped with the very latest electronics. The electronic system consists of the UBA 3 (= Universal Burner Automat 3) (see section 1, [**32**]) and the connected control panel, the BC10 (= Basic Controller 10) (see section 1, [**4**]).

The main task of this electronic system is to control and ensure the safe operation of the central heating boiler.

In addition, it is possible to call up display readings, settings and codes on the display of the BC10. The display settings can be changed after calling them up. Also see section 23 and section 28.

The working of the boiler during normal operation mode is explained in more detail in chapter 4 "Operation" on page 10. This chapter provides a step-by-step explanation of the boiler operation under normal operating conditions.

section 8 Safety and general instructions

Please observe these instructions in the interest of your own safety.

Designated use

The boiler was designed for heating water for a central heating system and generating domestic hot water.

The boiler is suitable for connection to fully pumped, sealed water systems ONLY.

The boiler can be installed either as a single system or as part of a multiple system (cascade system) with a maximum of 8 boilers connected together.

These boilers may not be installed in places over 4,000 ft. above sea level.

Hazard definitions

The following defined terms are used throughout the documentation to bring attention to the presence of hazards of various risk levels. Notices give important information concerning the operation of the product.

DANGER

Indicates the presence of hazards that will cause severe personal injury, death or substantial property damage.

WARNING

Indicates the presence of hazards that can cause severe personal injury, death or substantial property damage.

CAUTION

Indicates presence of hazards that will or cause minor personal injury or property damage.

CAUTION

Risk of electric shock.

Indicates presence of hazards due to electric shock.

NOTICE

Indicates special instructions on installation, operation or maintenance that are important but not related to personal injury or property damage.

The following instructions must be observed

- The boiler must only be used for its designated purpose, observing the Installation Instructions.
- Only use the boiler in the combinations and with the accessories and spares listed.
- Maintenance and repairs must only be carried out by trained professionals.
- You are only permitted to operate the condensing gas boiler with the combustion air/flue gas system that has been specifically designed and approved for this type of boiler.
- Please note that local approval of the flue system and the condensate connection to the public sewer system may be required.
- If boiler installation is provided as replacement heater, DO NOT connect new boiler venting to an existing vent system, if it is shared with other appliances.

You must also observe:

- The local building regulations stipulating the installation rules at the time of installation.
- The local building regulations concerning the air intake and outlet systems and the chimney connection.
- The regulations for the power supply connection.
- The technical rules laid down by the gas utility company concerning the connection of the gas burner fitting to the local gas main.
- The instructions and standards concerning the safety equipment for the water/space heating system.
- The Installation Instructions for building heating systems.
- The boiler must be located in an area where leakage of the tank or connections will not result in damage to the area adjacent to the boiler or to lower floors of the structure. When such locations cannot be avoided, it is recommended that a suitable drain pan, adequately drained, be installed under the boiler. The pan must not restrict combustion air flow.
- The boiler must be installed such that the gas ignition system components are protected from water (dripping, spraying, rain etc.) during boiler operation and service.
- The boiler must not be installed on carpeting.
- Do not restrict or seal any air intake or outlet openings.
- If you find any defects, you must inform the owner of the system of the defect and the associated hazard in writing.

DANGER
if flammable gas explodes.

Beware if you smell gas: there may be an explosion hazard!

Warning: If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other boiler.

What to do if you smell gas

- Do not try to light any boiler.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

Installation and service must be performed by a qualified installer, service agency or the gas supplier.

WARNING

Danger of fatal accident from explosive fumes.

- Only carry out work on gas pipes and fittings if you are properly registered.

WARNING

Dangerous flue gas can escape if the air supply is insufficient.

- Make sure that air vents are not reduced in size or obstructed.
- The boiler may only be operated after the defect has been remedied.
- Warn the user of the system of the defect verbally and in writing.

Heating system requirements

– Installing a dirt trap like a y-strainer and a desludging device is required. This must be installed in the heating system in the immediate vicinity of the boiler, in an easily accessible position between the boiler and the lowest point in the return of the system.
– Clean the dirt trap at every annual service.
– Never use salt bedding type exchangers (ion exchangers) to soften the water.
– The low loss header and boiler connection set must be installed (supplied with the boiler).
– When using oxygen-permeable pipes (plastic), e.g. for floor heating systems, you must separate the system using secondary heat exchangers.

Heating system water quality

The quality of the system water is very important. Poor water quality can damage heating systems due to scale formation and corrosion. For further details, please see the accompanying "Water quality requirements for Logamax plus GB162-80 kW/100 kW" manual.

CAUTION

Risk of system damage due to unsuitable heating system water.

- If oxygen-permeable pipes are used, e.g. for underfloor heating systems, the systems must be separated from one another by plate heat exchangers. Unsuitable heating system water promotes sludge and corrosion formation. This can result in heat exchanger malfunction and damage.

Pump test

If the boiler has not been operational for approx. 4 weeks, the pump will automatically run for 10 seconds every 24 hours. This pump test is first carried out 24 hours after the main power has been connected to the boiler.

Freeze protection

The boiler has integrated freeze protection that switches the boiler ON at a space heating (CH) water temperature of 45 °F (7 °C) and switches it OFF at a CH supply temperature of 59 °F (15 °C).

This feature does not protect the central heating system from freezing. If there is a risk of radiators or pipe sections freezing up, we recommend setting the pump run-over time to 24 hours.

Tools, materials and further equipment

For the installation and maintenance of the boiler you will need the standard tools for space heating, gas and water fitting.
In addition, a hand truck with a fastening belt is useful.

Disposal

– Dispose of the boiler packaging in an environmentally sound manner.
– Dispose of components of the heating system (e. g. boiler or control device), that must be replaced in an environmentally responsible manner.

section 9 General regulations

The installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the latest edition of the National Fuel Gas Code, ANSI Z223.1./NFPA 54. In Canada, installation must be in accordance with the requirements of CAN/CSA B149.1, Natural Gas and Propane Installation Code. Where required by the authority having jurisdiction, the installation must conform to the Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1. Install CO detectors per local regulations. Boiler requires yearly maintenance.

Operating Limits of the boiler:

Max. boiler temperature:	230 °F (110 °C)
Max. operating pressure:	30 psi (2.6 bar)
– with optional pressure relief valve	50 psi (3.45 bar).

The hot water distribution system must comply with all applicable codes and regulations. When replacing an existing boiler, it is important to check the condition of the entire hot water distribution system to ensure safe operation.

section 10 Regulations in Massachusetts

Massachusetts Installations Only:

(a) For all side wall side horizontally vented gas fueled equipment installed in every dwelling, building or structure used in whole or in part for residential purposes, including those owned or operated by the Commonwealth and where the side wall exhaust vent termination is less than seven (7) feet above finished grade in the area of the venting, including but not limited to decks and porches, the following requirements shall be satisfied:

1. INSTALLATION OF CARBON MONOXIDE DETECTORS. At the time of installation of the side wall horizontal vented gas fueled equipment, the installing plumber or gasfitter shall observe that a hard wired carbon monoxide detector with an alarm and battery back-up is installed on the floor level where the gas equipment is to be installed. In addition, the installing plumber or gasfitter shall observe that a battery operated or hard wired carbon monoxide detector with an alarm is installed on each additional level of the dwelling, buiding or structure served by the side wall horizontal vented gas fueled equipment. It shall be the responsibility of the property owner to secure the services of qualified licensed professionals for the installation of hard wired carbon monoxide detectors.
   a. In the event that the side wall horizontally vented gas fueled equipment is installed in a crawl space or an attic, the hard wired carbon monoxide detector with alarm and battery back-up may be installed on the next adjacent floor level.
   b. In the event that the requirements of this subdivision can not be met at the time of completion of installation, the owner shall have a period of thirty (30) days to comply with the above requirements; provided, however, that during said thirty (30) day period, a battery operated carbon monoxide detector with an alarm shall be installed.
2. APPROVED CARBON MONOXIDE DETECTORS. Each carbon monoxide detector as required in accordance with the above provisions shall comply with NPA 720 and be ANSI/UL 2034 listed and IAS certified.
3. SIGNAGE. A metal or plastic identification plate shall be permanently mounted to the exterior of the building at a minimum height of eight (8) feet above grade directly in line with the exhaust vent terminal for the horizontally vented gas fueled heating appliance or equipment. The sign shall read, in print size no less than one-half (½) inch in size, “GAS VENT DIRECTLY BELOW. KEEP CLEAR OF ALL OBSTRUCTIONS”.
4. INSPECTION. The state or local gas inspector of the side wall horizontally vented gas fueled equipment shall not approve the installation unless, upon inspections, the inspector observes carbon monoxide detectors and signage installed in accordance with the provisions of 248 CRM 5.08(2)(a)1 through 4.

(b) EXEMPTIONS: The following equipment is exempt from 248 CRM 5.08(2)(a)1 through 4:

1. The equipment listed in Chapter 10 entitled “Equipment Not Required To Be Vented” in the most current edition of NFPA 54 as adopted by the board: and
2. Product Approved side wall horizontally vented gas fueled equipment installed in a room or structure separate from the dwelling, building or structure used in whole or in part for residential puposes.

(c) MANUFACTURERS REQUIREMENTS - GAS EQUIPMENT VENTING SYSTEM REQUIRED.
When the manufacturer of Product Approved side wall horizontally mounted gas equipment provides a venting system design or venting system components with the equipment, the instructions provided by the manufacturer for the installation of the equipment and venting shall include:

1. Detailed instructions for the installation of the venting system or the venting system components: and
2. A complete parts list for the venting system design or venting system.

(d) MANUFACTURERS REQUIREMENTS - GAS EQUIPMENT VENTING SYSTEM NOT PROVIDED.
When the manufacturer of Product Approved side wall horizontally vented gas fueled equipment does not provide the parts for the venting of flue gases, but identifies “special venting systems”, the following requirements shall be satisfied by the manufacturer:

1. The referenced “special venting systems” shall be included with the appliance or equipment installation instructions: and
2. The “special venting systems” shall be Product Approved by the Board, and the instructions for that system shall include a parts list and detailed installation instructions.

(e) A copy of all instructions for all Product Approved side wall horizontally vented gas fueled equipment, all venting instructions, all parts lists for venting instructions, and/or venting design instructions shall remain with the appliance or equipment at the completion of the installation.

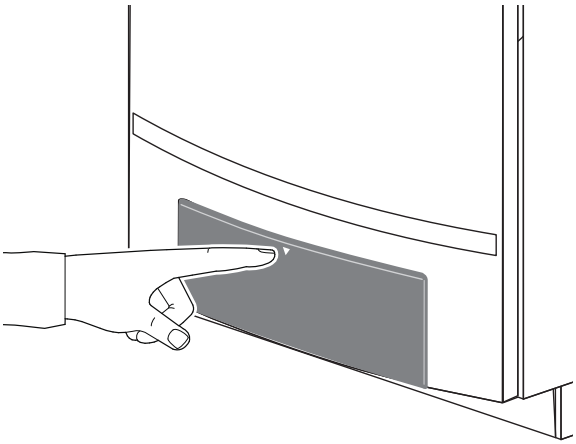
section 11 General

General points

The heating boiler is fitted with a control panel, the BC10 basic controller. The BC10 can be used to control the heating system.

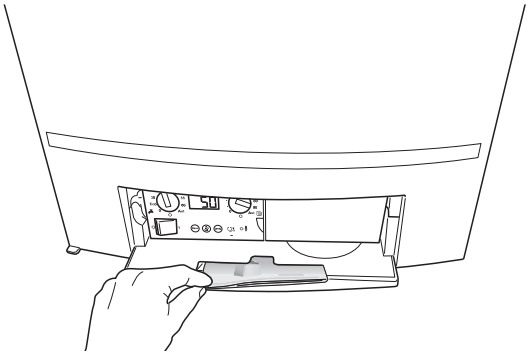
In addition, it is possible to call up display readings, settings and codes on the display of the BC10. The display settings can be changed after calling them up. See chapter 5 "Symptoms" on page 21.

section 12



- Briefly press the access cover of the BC10 to open it.

section 13

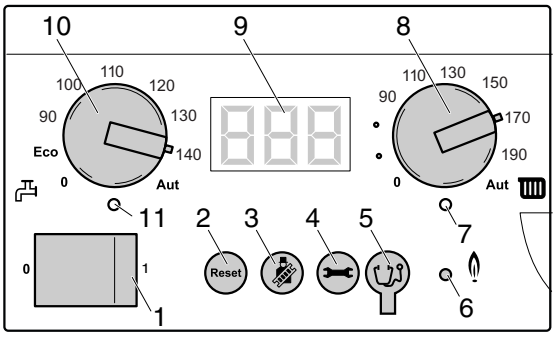


The control panel is located on the left, behind the access cover [**2**].

The Operating Instructions are located in a compartment on the back of the access cover [**1**].

section 14

The control panel has the following elements:



1: Main power switch
2: "Reset" button
3: "Chimney sweep" button
4: "Service" button
5: Service Tool Connector
6: LED "Burner operation"
7: LED "Central heat demand"
8: Space heating water temperature knob
9: Display
10: DHW temperature knob
11: LED "DHW demand"

Main power switch

The main power switch [**1**] is used to switch the mains power to the heating boiler on and off.

"Reset" button

With certain faults you may have to restart the boiler by pressing the "Reset" button [**2**]. This is only required in the event of a "locking" fault (can be recognized by a flashing error code in the display). During a reset, the display shows [rE].

Blocking errors (which can be recognized by a non-flashing error code) are reset automatically as soon as their cause has been removed.

"Chimney sweep" button

The "Chimney sweep" button [**3**] is used to activate a flue gas test, the service mode or manual operation.

The **flue gas test** enables the boiler to be run in full-load operation manually for a short period. See also section 20, "Flue Gas Test menu", page 13.

The **service mode** enables the boiler to be run in part-load operation manually for a short period. The service mode should be used to carry out measurements and settings on the boiler. See also section 21, "Service Mode menu", page 14.

section 15

The **manual operation mode** enables the boiler to be run manually for a long period. Manual operation should be used for situations where the controller has not been installed yet, or where the controller is out of order. See also section 22, "Manual Operation menu", page 15.

A maximum heating system supply temperature in accordance with the setting of the space heating water temperature knob (section 14, [**8**]) on the BC 10 applies during the flue gas test, service and manual operation.

DAMAGE TO THE INSTALLATION

with floor heating: by the pipework being overheated.

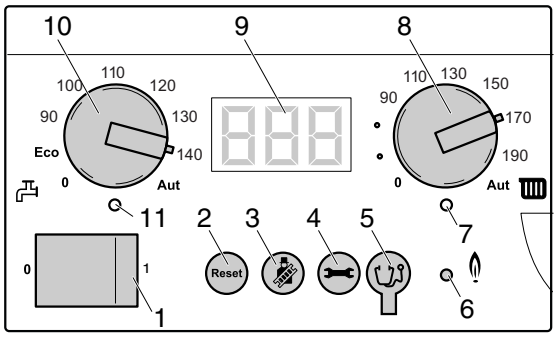
- Use the space heating water temperature knob [**8**] to limit the maximum heating system supply temperature to the permitted heating system supply temperature of the floor heating circuit. This is usually approximately 104 °F (40 °C).

DAMAGE TO THE INSTALLATION

due to frost while manual operation is switched on.

After a power failure or after switching off the main voltage, the heating system may freeze since manual operation is no longer active.

- Re-activate manual operation after switching on the heating system, so that the system is permanently in operation.



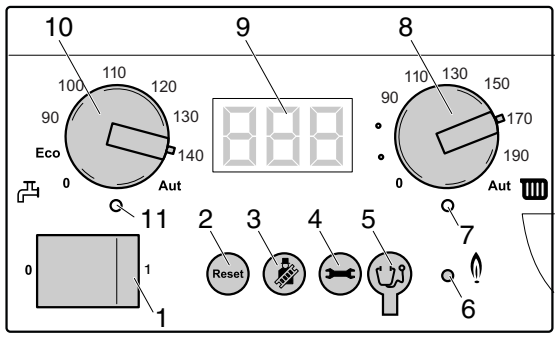
"Service" button

The "Service" button [**4**] is used to display the heating system supply temperature, the water pressure on the heating system etc. See also section 27 "Display readings", section 28 "Display settings" and section 29 "Display codes and other symptoms".

USER INSTRUCTION

If there is a risk of radiators or pipe sections freezing up, we recommend setting the pump run-over time to 24 hours. See section 28 "Display settings".

section 16



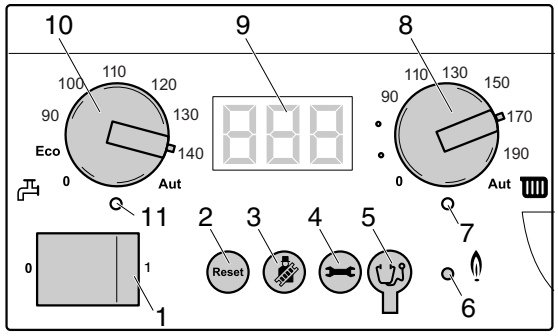
LED "Burner operation"

The LED "Burner operation" [**6**] lights up when the burner of the heating boiler is active and it is extinguished when the burner is no longer in operation.

The LED "Burner operation" indicates the burner status.

LED	Status	Explanation
On	Burner operational	The heating water is being heated.
Off	Burner off	The heating water has reached the required temperature range and there is no heat demand.

section 17



LED "Central heat demand"

The LED "Central heat demand" [**7**] lights up as soon as there is a heat demand from the control system and is extinguished as soon as there is no longer a heat demand.

Space heating water temperature knob

The Space heating water temperature knob [8] is used to set the maximum heating system supply temperature. The unit is °F. See table 2.

Knob position	Explanation
0	Heating mode off (but still DHW operation possible).
85 – 194	The maximum heating system supply temperature in °F.
Aut [1)]	The maximum heating system supply temperature is 194 °F (90 °C).

table 2

1) for use with Buderus controls

Display

The display [**9**] can show display readings, display settings and display codes. If a fault occurs the display will immediately show the accompanying fault code. If a locking fault has occurred, the display code will flash.

DHW temperature knob

The DHW temperature knob [**10**] is used to set the DHW temperature as required. The unit is °F. See table 3.

Knob position	Meaning	Legionella indication
0	DHW mode is off (but heating operation may still be possible).	Legionella propagation ruled out
ECO	Do not use this setting!	
85 – 115	The required DHW temperature in °F.	Very low risk if hot water is used daily
115 – 140	The required DHW temperature in °F.	Legionella propagation ruled out. This position is recommended.
Aut [1)]	The required DHW temperature is 140 °F (60 °C).	Legionella propagation ruled out.

table 3

1) for use with Buderus controls

LED "DHW demand"

The LED "DHW demand" [**11**] lights up as soon as water is being heated as the result of a hot water demand and is extinguished as soon as the heating system for DHW mode is switched off.

section 18 Menu structure

The boiler menu structure can be browsed on the BC10 using the "Reset", "Chimney sweep" or "Service" buttons (section 17, [**2**], [**3**] and [**4**]) and the display (section 17, [**9**]).

The boiler menu structure consists of 5 menus:

– Normal Operation menu (section 19, page 13);
– Flue Gas Test menu (section 20, page 13);
– Service Mode menu (section 21, page 14);
– Manual Operation menu (section 22, page 15);
– Settings menu (section 23, page 15).

section 19 Normal Operation menu

Step 1	75 **Display reading: Currently measured heating system supply temperature in °F.** See also section 27 "Display readings", page 21.	
Step 2	Continue in Normal Operation menu?	Yes: → Step **3** No: → Step **1**
Step 3	● Press the "⊖" button.	
Step 4	P22 **Display reading: Currently measured heating system water pressure in PSI.** See also section 27 "Display readings", page 21.	
Step 5	● Press the "⊖" button.	
Step 6	-H **Random operating code. In this case: Operating code: The boiler is in heating mode.** See also section 29 "Display codes and other symptoms", page 21, and further.	
Step 7	Have at least 5 seconds passed without a button being pressed and/or has the main voltage been interrupted ?	Yes: → Step **1** No: → Step **8**
Step 8	● Press the "⊖" button.	→ Step **1**

section 20 Flue Gas Test menu

Step 1	75 **Display reading: Currently measured heating system supply temperature in °F.** See also section 27 "Display readings", page 21.	
Step 2	Activate flue gas test?	Yes: → Step **3** No: → Step **1**
Step 3	To activate the flue gas test: ● Press and hold the "⊜" button for more than 2 but not longer than 5 seconds.	
Step 4	75. **Display reading: Current heating system supply temperature in °F.** As soon as a **non**-flashing dot is shown in the bottom right-hand corner of the display, the flue gas test has been activated. This means that the boiler is in heating mode at a capacity of 100 % for a maximum period of 30 minutes. The maximum heating system supply temperature set on the control panel now applies. DHW mode is not possible during the flue gas test.	
Step 5	● Press the "⊖" button.	
Step 6	P22 **Display reading: Currently measured heating system water pressure in PSI.** See also section 27 "Display readings", page 21.	
Step 7	● Press the "⊖" button.	
Step 8	-A. **Operating code: A flue gas test is being carried out or the boiler is in service mode.** **Flue gas test:** The boiler is in heating mode at a capacity of 100 % for a maximum of 30 minutes. The maximum heating system supply temperature set on the control panel now applies. **Service mode:** The boiler is in heating mode at a reduced capacity for a period of 30 minutes. The maximum heating system supply temperature set on the control panel now applies. DHW mode is not possible during the flue gas test or during service mode. See also section 29 "Display codes and other symptoms", page 21.	
Step 9	Press the "⊖" button.	
Step 10	75. **Display reading: Currently measured heating system supply temperature in °F.** See also section 27 "Display readings", page 21.	
Step 11	Have 30 minutes passed or has the main voltage been interrupted?	Yes: → Step **1** No: → Step **12**
Step 12	Deactivate flue gas test?	Yes: → Step **13** No: → Step **5**
Step 13	To deactivate the flue gas test: ● Press and hold the "⊜" button for more than 2 seconds until the dot disappears.	→ Step **1**

section 21 Service Mode menu

Step 1	75 **Display reading: Currently measured heating system supply temperature in °F.** See also section 27 "Display readings", page 21.	
Step 2	Activate service mode?	Yes: → Step **3** No: → Step **1**
Step 3	To activate service mode, step 1: ● Press and hold the "" button for more than 2 but not longer than 5 seconds.	
Step 4	75. **Display reading: Currently measured heating system supply temperature in °F.** As soon as a **non**-flashing dot is shown in the bottom right-hand corner of the display, the boiler will run in heating mode at 100 % performance for a maximum of 30 minutes. The maximum heating system supply temperature set on the control panel now applies. DHW mode is not possible during service mode operation.	
Step 5	To activate service mode, step 2: ● Press and hold the ""+ "" buttons for more than 2 seconds.	
Step 6	L - -. **Display setting: Maximum capacity setting during heating mode as a %.** See also section 28 "Display settings", page 21. In this case: L - -. = 100 % Service mode has been activated. You can now temporarily lower the boiler performance to partial load to check - and if relevant adjust- the gas/air ratio or the ionization current.	
Step 7	● Press and hold the "Reset" button until the display shows for boilers at sea level L25. with a 80 kW boiler or L20. with a 100 kW boiler.	
Step 8	L20. or L25. **Display setting: Minimum capacity setting during service mode as a %.** See also section 28 "Display settings", page 21. Within a couple of seconds the boiler will be modulated back to 20 % of its capacity in case of an 80 kW boiler and 25 % in case of a 100 kW boiler. The maximum heating system supply temperature set on the control panel now applies (section 1, [**4**]). Check the gas/air ratio or the ionization current and if necessary set the gas/air ratio according to section section 119 "Measuring and adjusting the gas/air ratio", page 84 or section 104 "Measure the ionization current", page 76.	
Step 9	● Press the "" button.	
Step 10	F 5. **Display setting: required pump run-over time after the end of the heating operation in minutes.** See also section 28 "Display settings", page 21.	
Step 11	● Press the "" button.	
Step 12	C 1. **Display setting: required DHW mode position (on/off).** This setting has priority over -for example- a possible DHW mode (On/Off) setting on a room thermostat. See also section 28 "Display settings", page 21.	
Step 13	● Press the "" button.	
Step 14	75. **Display reading: Currently measured heating system supply temperature in °F.** See also section 27 "Display readings", page 21.	
Step 15	● Press the "" button.	
Step 16	P22 **Display reading: Currently measured heating system water pressure in PSI.** See also section 27 "Display readings", page 21.	
Step 17	● Press the "" button.	
Step 18	-A . **Operating code: The boiler is in service mode.** See also section 29 "Display codes and other symptoms", page 21, and further.	
Step 19	● Press the "" button.	
Step 20	75. **Display reading: Currently measured heating system supply temperature in °F.** See also section 27 "Display readings", page 21.	
Step 21	Have 30 minutes passed or has the main voltage been interrupted?	Yes: → Step **22** No: → Step **23**
Step 22	Service mode is deactivated.	→ Step **25**
Step 23	Deactivate service mode?	Yes: → Step **24** No: → Step **15**
Step 24	To deactivate the service mode: ● Press and hold the "" button for more than 2 seconds until the dot disappears.	
Step 25	The boiler performance is then reduced according to the settings made in the "Settings" menu in section 23, page 15.	→ Step **1**

section 22 Manual Operation menu

Step 1	75 **Display reading: Currently measured heating system supply temperature in °F** See also section 27 "Display readings", page 21.	
Step 2	Activate manual operation?	Yes: → Step **1** No: → Step **1**
Step 3	To activate manual operation: ● Press and hold the "⚙" button for more than 5 seconds.	
Step 4	75 **Display reading: Currently measured heating system supply temperature in °F.** As soon as a flashing dot is shown in the bottom right-hand corner of the display, manual operation is active. This means that the boiler is permanently in heating mode. The maximum heating system supply temperature set on the control panel now applies (section 1, [**4**]). The LED "Central heat demand" lights up.	
Step 5	● Press the "⊖" button.	
Step 6	P22 **Display reading: Currently measured heating system water pressure in PSI.** See also section 27 "Display readings", page 21.	
Step 7	● Press the "⊖" button.	
Step 8	-H **Operating code. The device is in manual operation mode.** See also section 29 "Display codes and other symptoms", page 21. During manual operation the "Settings" menu in section 23 from step 3 can be used to temporarily change the target boiler performance. DHW mode is possible during manual operation. **CAUTION:** If the boiler performance has been changed temporarily, it must be reset after ending manual operation, according to the "Settings" menu, section 23, page 15	
Step 9	● Press the "⊖" button.	
Step 10	75 **Display reading: Currently measured heating system supply temperature in °F.** See also section 27 "Display readings", page 21.	
Step 11	Has the main voltage been interrupted?	Yes: → Step **1** No: → Step **12**
Step 12	Deactivate manual operation?	Yes: → Step **13** No: → Step **5**
Step 13	To deactivate manual operation: ● Press and hold the "⚙" button for more than 2 seconds until the dot disappears.	→ Step **1**

section 23 Settings menu

Step 1	75 **Display reading: Currently measured heating system supply temperature in °F.** See also section 27 "Display readings", page 21.	
Step 2	Open the "Settings" menu?	Yes: → Step **3** No: → Step **1**
Step 3	To open the Settings menu: ● Press and hold the "⚙" + "⊖" buttons for more than 2 seconds.	
Step 4	L_ _ **Display setting: target boiler performance as a %.** See also section 28 "Display settings", page 21. As soon as the display shows L_ _, the "Settings" menu is open. The boiler performance can be set using the first parameter shown on the display.	
Step 5	Adjust boiler performance?	No: → Step **7** Yes: → Step **6**
Step 6	**Lower**: Decrease the target boiler performance with the "Reset" button. The minimum setting for boilers at sea level is L25 = 25 % for an 80 kW heating boiler and L20 = 20 % for a 100 kW heating boiler. **Higher**: Increase the target boiler performance with the "⚙" button. The maximum setting is L_ _ = 100 %. Otherwise, this concerns the factory-adjusted setting.	
Step 7	● Press the "⊖" button.	
Step 8	F 5 **Display setting: Target pump run-over time after heating mode has elapsed in minutes.** Set the second parameter as soon as the display shows F 5. **Recommendation:** Do not set a pump run-over time of less than F 5 (= 5 minutes).	

section 23 Settings menu (continued)

Step 9	Set the pump run-over time after heating operation has ended?	Yes: → Step **10** No: → Step **11**
Step 10	**Lower**: Decrease the target pump run-over time after the end of heating operation with the "Reset" button. The minimum setting is [F 0] = 0 minutes. The factory default setting is 5 minutes. **Higher**: Increase the target pump run-over time after the end of heating operation with the " " button. The minimum setting is [F 1d] = 24 hours.	
Step 11	● Press the " " button.	
Step 12	[C 1] **Display setting: required DHW mode position (on/off).** See also section 28 "Display settings", page 21. Set the third parameter as soon as the display shows [C 1].	
Step 13	Set the DHW mode status?	Yes: → Step **14** No: → Step **15**
Step 14	● Set the DHW mode On or Off with the "Reset" or " " buttons. [C 1] is "On", [C 0] is "Off". **Note!** If [C 0] is set, the frost protection for the internal or external hot water tank heater is switched off.	
Step 15	Have at least 5 seconds passed without a button being pressed and/or has the main voltage been interrupted ?	Yes: → Step **17** No: → Step **16**
Step 16	● Press the " " button.	
Step 17	[75] **Display reading: Currently measured heating system supply temperature in °F**. See also section 27 "Display readings", page 21. Any adjustments that you have made have been confirmed.	→ Step **1**

section 24 Operation

	Start-up phase	
Step 1	● Switch “On” the power supply to the boiler.	
Step 2	● Turn the main power switch on the BC10 to position "1" (On), also see section 14.	
Step 3	The LED of the UBA 3 (section 1, [**32**]) lights up for 1 second. This means that the UBA 3 is reading the KIM. When installing a new KIM or a new UBA 3, the LED will flash at a high frequency for max. 10 seconds while the data is being exchanged.	
Step 4	8.8.8. **Operating code: The display is tested during starting up, immediately after switching on the main voltage. This code is displayed for a maximum of 1 second.** See also section 29 "Display codes and other symptoms", page 21.	
Step 5	- **Operating code: A communication test is carried out during starting up. This display code flashes to check the communication between the UBA 3 (section 1, [32]) and the control panel (section 1, [4]) for 3-5 times during a period of 3-5 seconds while starting up. If a new UBA3 or a new KIM was fitted, this code will flash for max. 10 seconds.** See also section 29 "Display codes and other symptoms", page 21.	
Step 6	75 **Display reading: Currently measured heating system supply temperature in °F**. See also section 27 "Display readings", page 21.	
Step 7	● Press the "⊖" button.	
Step 8	P22 **Display reading: Currently measured heating system water pressure in PSI.** See also section 27 "Display readings", page 21.	
Step 9	● Press the "⊖" button.	
Step 10	0U **Operating code: The boiler starts up after activation of the mains power supply or completion of a system reset.** Start of water-side flow check: The pump will carry out max. 4 attempts to restore the water flow. Start of air-side pre-purge phase. The fan unit runs at about 60 % of maximum speed for 15 seconds. See also section 29 "Display codes and other symptoms", page 21.	
Step 11	Has the air-side pre-purge phase been completed without any problems?	Yes: → Step **13** No: → Step **12**
Step 12	● Now remedy the fault by following the section relating to the error code that is now displayed. See also section 29. As soon as a locking fault occurs (indicated by a flashing display code), the pump is activated to run continuously, thus minimizing the risk of the heating system freezing up.	→ Step **1**
	Readiness for operation	
Step 13	0H **Operating code. The boiler is in standby mode. No current heat requirement.** See also section 29 "Display codes and other symptoms", page 21.	
Step 14	Start of pump over-run time for the heating system. The pump over-run time for the heating system can be adjusted as per section 23. Factory-adjusted setting: 5 minutes	
Step 15	Has the preset pump over-run time expired?	Yes: → Step **19** No: → Step **16**
Step 16	Is there a DHW heating system which has generated a heat demand?	Yes: → Step **29** No: → Step **17**
Step 17	Is there a current heat demand from the room or external temperature-dependent controller?	Yes: → Step **48** No: → Step **18**
Step 18	Is the current heating-system supply temperature lower than 45 °F (7 °C)?	Yes: → Step **65** No: → Step **15**
Step 19	The pump stops.	
Step 20	Has the pump been out of use for more than 24 hours?	Yes: → Step **24** No: → Step **21**
Step 21	Is there a DHW heating system which has generated a demand?	Yes: → Step **29** No: → Step **22**

section 24		
Step 22	Is there a current heat demand from the room or external temperature-dependent controller?	Yes: → Step **48** No: → Step **23**
Step 23	Is the current heating-system supply temperature lower than 45 °F (7 °C)?	Yes: → Step **65** No: → Step **20**
Step 24	The pump is run for 10 seconds in order to prevent it from seizing up.	
Step 25	Have ten seconds elapsed?	Yes: → Step **19** No: → Step **26**
Step 26	Is there a DHW heating system which has generated a demand?	Yes: → Step **29** No: → Step **27**
Step 27	Is there a current heat demand from the room or external temperature-dependent controller?	Yes: → Step **48** No: → Step **28**
Step 28	Is the current heating-system supply temperature lower than 45 °F (7 °C)?	Yes: → Step **65** No: → Step **25**
	DHW operating phase	
Step 29	The LED "DHW demand" on the control panel (section 1, [**4**]) lights up.	
Step 30	0C Operating code. The boiler prepares for a burner start-up whenever a heat demand arises. The fan unit (section 1, [**20**]) and the pump are started. The glow ignitor (section 1, [**27**]) is activated.	
Step 31	0L **Operating code. The gas valve (section 1, [21]) is activated.** See also section 29 "Display codes and other symptoms", page 21.	
Step 32	Maximum four ignition attempts are carried out. Does the ionization current exceed 1.4 microamperes within these 4 ignition attempts?	Yes: → Step **33** No: → Step **12**
Step 33	-H **Operating code: The device is in DHW mode.** See also section 29 "Display codes and other symptoms", page 21. The LED "Burner operation" on the control panel (section 1, [**4**]) lights up. The startup load on the boiler is approx. 50 % for the purposes of flow monitoring and is then modulated up or down. The degree of modulation of the pump will hardly vary during DHW mode; the pump will be running almost continuously at 100 %.	
Step 34	Is there still a heat demand?	Yes: → Step **35** No: → Step **40**
Step 35	Is the heating-system supply temperature 45 °F (25 °C) higher than the preset DHW temperature or higher than 200 °F (93 °C)?	Yes: → Step **36** No: → Step **33**
Step 36	0Y **Operating code: The supply temperature sensor has measured a current heating supply temperature higher than the supply temperature setting on the control panel (section 1, [4]), or higher than the supply temperature calculated according to the heating curve or higher than the supply temperature calculated according to the DHW mode.**	
Step 37	The LED "Burner operation" is extinguished.	
Step 38	The fan unit (section 1, [**20**]) continues to run for max. 30 seconds.	
Step 39	Has the heating system supply temperature fallen sufficiently?	Yes: → Step **29** No: → Step **39**
Step 40	The gas valve (section 1, [**21**]) is closed and the burner is shut down.	
Step 41	The LED "Burner operation" is extinguished.	
Step 42	The LED "DHW demand" is extinguished.	
Step 43	0H **Operating code. The boiler is in standby mode. There is no current heat demand.** Start of pump over-run time via the tank for a period of approx. 60 seconds. Start of air-side purging phase of the fan unit (section 1, [**20**]) for approx. 30 seconds. See also section 29 "Display codes and other symptoms", page 21.	
Step 44	Have approx. 30 seconds elapsed?	Yes: → Step **45** No: → Step **44**

section 24		
Step 45	The fan unit (section 1, [**20**]) stops.	
Step 46	Have approx. 60 seconds elapsed?	Yes: → Step **47** No: → Step **46**
Step 47	The pump stops. See also section 29 "Display codes and other symptoms", page 21.	
	Boiler operating phase	
Step 48	The LED "Central heat demand" lights up.	
Step 49	0C **Operating code. The boiler prepares for a burner start-up whenever a heat demand arises. The fan unit (section 1, [20]) and the pump are started. The glow ignitor (section 1, [27]) is activated.** See also section 29 "Display codes and other symptoms", page 21.	
Step 50	0L **Operating code. The gas valve (section 1, [21]) is activated.** See also section 29 "Display codes and other symptoms", page 21.	
Step 51	Maximum of four ignition attempts are carried out. Does the ionization current exceed 1.4 microamperes within these 4 ignition attempts?	Yes: → Step **52** No: → Step **12**
Step 52	-H **Operating code. The device is in heating mode.** See also section 29 "Display codes and other symptoms", page 21. The LED "Burner operation" on the control panel (section 1, [**4**]) lights up. The startup load on the boiler is approx. 50 % for the purposes of flow monitoring and is then modulated up or down. The pump modulation degree will vary strongly during heating operation.	
Step 53	Is there still a heat demand from the room or external temperature-dependent controller?	Yes: → Step **54** No: → Step **59**
Step 54	Is the heating-system supply temperature higher than the target setting? When working with an external temperature-dependent controller, the target setting is calculated by the controller; when working with a room temperature control device it is set on the control panel (section 1, [**4**]).	Yes: → Step **55** No: → Step **52**
Step 55	0Y **Operating code: The supply temperature sensor as measured a current heating supply temperature higher than the supply temperature setting on the control panel (section 1, [4]), or higher than the supply temperature calculated according to the heating curve or higher than the supply temperature calculated according to the DHW mode.** See also section 29 "Display codes and other symptoms", page 21.	
Step 56	The LED "Burner operation" is extinguished.	
Step 57	The fan unit (section 1, [**20**]) continues to run for max. 30 seconds.	
Step 58	Has the heating system supply temperature fallen sufficiently?	Yes: → Step **49** No: → Step **58**
Step 59	The LED "Central heat demand" is extinguished.	
Step 60	0H **Operating code. The boiler is in standby mode. There is no current heat demand.** See also section 29 "Display codes and other symptoms", page 21. The gas valve (section 1, [**21**]) is closed and the burner (section 1, [**23**]) is shut down.	
Step 61	The LED "Burner operation" is extinguished.	
Step 62	Start of pump over-run time for the heating system. The pump over-run time for the heating system can be adjusted as per section 23. Factory-adjusted setting: 5 minutes. Start of air-side flushing phase of the fan unit (section 1, [**20**]) for approx. 30 seconds.	
Step 63	Have approx. 30 seconds elapsed?	Yes: → Step **64** No: → Step **63**
Step 64	The fan unit (section 1, [**20**]) stops.	→ Step **15**

Frost-protection operating phase		
Step 65	The LED "Central heat demand" lights up.	
Step 66	0C **Operating code. The boiler prepares for a burner start-up whenever a heat demand arises. The fan unit (section 1, [20]) and the pump are started. The glow ignitor (section 1, [27]) is activated.** See also section 29 "Display codes and other symptoms", page 21.	
Step 67	0L **Operating code. The gas valve (section 1, [21]) is activated.** See also section 29 "Display codes and other symptoms", page 21.	
Step 68	Maximum of four ignition attempts are carried out. Does the ionization current exceed 1.4 microamperes within these 4 ignition attempts?	Yes: → Step **69** No: → Step **12**
Step 69	-H **Operating code: The device is in heating mode.** See also section 29 "Display codes and other symptoms", page 21. The LED "Burner operation" is lit up. The boiler is in heating mode.	
Step 70	Is the current heating-system supply temperature higher than 59 °F (15 °C)?	Yes: → Step **59** No: → Step **69**

section 25 Symptoms

You can find a further explanation of the symptoms in section 6 on page 6.

section 26 Removing the control panel

To make it easier to operate the BC10 when the boiler door is open and to make it easier to read the display, the BC10 can be temporarily attached to the boiler in a suspended position while carrying out service activities. See section 68, page 56.

section 27 Display readings

Display reading	Meaning	Unit	Range
75	**Display reading** Current heating system supply temperature in °F.	°F	48 – 266
P22	**Display reading** Current heating system water pressure in PSI.	PSI	P00 – P58

section 28 Display settings

Display setting	Meaning	Unit	Range	Factory setting
L99	**Display setting:** Logamax plus GB162-80 kW target boiler performance as a %	%	L25 – L99 / L__. 100 %	L__.
L99	**Display setting:** Logamax plus GB162-100 kW target boiler performance as a %	%	L20 – L99 / L__. 100 %	L__.
F 5	**Display setting:** Target pump over-run time in minutes after heating mode has ended. **Recommendation:**Do not set a pump over-run time of less than F 5 (= 5 minutes).	Min.	F00 – F60 / F 1d 24 hours	F 5
C 1	**Display setting:** required DHW supply position (on/off). This setting has priority over -for example- a possible DHW mode (On/Off) setting on a room thermostat. **Note!** If the setting C 0 has been made, the frost protection of the DHW heating system has also been switched off.		C 0 "Off" / C 1 "On"	C 1

section 29 Display codes and other symptoms

Display code: Main display code	Display code: Sub-display code	Display code: Meaning	Display code: Reset required?	LED on UBA 3	Other symptoms	Diagnosis
		No display code		Off	No indication on the display of the BC10 (section 1, [4]).	→ section 31
		No display code		Off	On devices with DHW operation: no or insufficient DHW; radiators, convectors, etc. may be heated without current heat demand.	→ section 32
		No display code		Off	On devices with DHW operation: hot water may be available, no heating operation. On devices without DHW operation: no heating operation.	→ section 33
		No display code		Off	No indication on the display of the BC10 (section 1, [4]).	→ section 34

section 29 Display codes and other symptoms

Display code							LED on UBA 3	Other symptoms	Diagnosis
	Main display code		Sub-display code		Meaning	Reset required?			
					Operating code: A communication test is carried out while starting up. This display code flashes to check the communication between the UBA 3 (section 1, [**32**]) and the control panel (section 1, [**4**]) 3-5 times during a period of 3-5 seconds while starting up. If a new UBA 3 or a new KIM has been fitted, this display code will flash for max. 10 seconds.		Off or flashing at 8 Hz		
					Fault code: If this code continues to flash on the display, there is a fault in the communication between the UBA 3 (section 1, [**32**]) and the control panel (section 1, [**4**]).		Off or flashing at 8 Hz	No heating operation and no DHW.	→ section 66
					Operating code: The boiler is in flue gas test or service mode. **Flue gas test:** The boiler is in heating mode at a performance capacity of 100 % for a period of 30 minutes. The maximum heating system supply temperature set on the control panel now applies (section 1, [**4**]). **Service mode:** the boiler will run in heating mode at a reduced performance capacity for 30 minutes. The maximum heating system supply temperature set on the control panel now applies (section 1, [**4**]). DHW mode is not possible during the flue gas test or during service mode.		Off	No DHW operation.	
					Operating code: The boiler is in manual operation mode.		Off		
	 2)		 *1)*		**Operating code:**The boiler is in flue gas test or service mode. **Flue gas test:** the boiler will run in heating mode at 100 % performance capacity for 30 minutes. The maximum heating system supply temperature set on the control panel now applies (section 1, [**4**]). **Service mode:** the boiler will run in heating mode at a reduced performance capacity for 30 minutes. The maximum heating system supply temperature set on the control panel now applies (section 1, [**4**]). DHW mode is not possible during the flue gas test or during service mode.		Off	No DHW operation.	
			 1)		**Operating code:** The boiler is in heating mode.		Off		
	 3)		 *1)*		**Operating code:** The boiler is in manual operation mode.		Off		
			 1)		**Operating code:** The boiler is in DHW mode.		Off		
			 1)		**Operating code:**The switch optimization program is activated. This program is activated if a hot water request from an RC regulator or an ON/OFF controller occurs more frequently than once every 10 minutes. This means that the boiler cannot be restarted until at least ten minutes have elapsed since initial startup of the burner.		Off	The target room temperature possibly is not reached.	→ section 35
			 1)		**Operating code:**The heating boiler cannot start up temporarily after DHW mode has ended.		Off		

section 29 Display codes and other symptoms

Display code						Reset required?	LED on UBA 3	Other symptoms	Diagnosis
	Main display code		Sub-display code		Meaning				
	0C		283 *1)*		**Operating code:** The heating boiler prepares for a burner start-up whenever a heat demand has occurred. The fan unit (section 1, [**22**]) and the pump are started. The glow ignitor (section 1, [**29**]) is activated.		Off		
	0E		265 *1)*		**Operating code:** The time-proportional program is activated. The time-proportional program is activated as soon as the required modulating control performance is lower than the bottom limit of the device performance. During the time-proportional program the burner (section 1, [**4**]) is switched on and off repeatedly during a period of 10 minutes. The period in which the burner is switched on depends on the difference between the required performance of the modulating control and the lower limit of the device performance. As soon as the burner has been switched on, the boiler runs at minimum capacity and the display of the control panel (section 1, [**4**]) shows -H. As soon as the burner is switched off, the operating code 0E is indicated in the display. **Example:** The device performance is 25 kW, the bottom limit of the device performance is at 20 % and the required modulating control performance is 5 %. This means that the burning time is then a quarter of the total time frame of 10 minutes, i.e. the burning time is 2.5 minutes. The Off time is then 10 min. - 2.5 min. = 7.5 min.		Off		
	0H		203 *1)*		**Operating code:** The boiler is in standby mode. No heat demand is created.		Off		
	0L		284 *1)*		**Operating code:** The gas valve (section 1, [**21**]) is activated.		Off		
	0U		270 *1)*		**Operating code:** The boiler starts up after activation of the mains power supply or completion of a system reset. **Start of the water-side supply check:** The pump will carry out max. 4 attempts to restore the water flow. **Start of air-side pre-purging phase:** The fan (section 1, [**20**]) runs for 15 seconds at about 60 % of its maximum speed (applies to all Logamax plus GB162 devices). This code is displayed for a maximum of 4 minutes.		Off		
	0Y		204 *1)*		**Operating code:** The supply temperature sensor (section 1, [**24**]) has detected that the current heating-system supply temperature is higher than the temperature entered at the control panel (section 1, [**4**]), or that it is higher than the heating-system supply temperature calculated according to the heating curve, or that it is higher than the heating-system supply temperature calculated for DHW mode.		Off	The target room temperature possibly is not reached.	→ section 36
	0Y		276		**Blocking fault code:** The supply temperature sensor (section 1, [**24**]) has measured a current heating supply temperature higher than 203 °F (95 °C).	No *5) 7)*	Off	The target room temperature possibly is not reached. Possibly no DHW operation.	→ section 37
	0Y		277		**Blocking fault code:** The safety temperature sensor (section 1, [**28**]) has measured a current supply temperature higher than 203 °F (95 °C).	No *5) 7)*	Off	The target room temperature possibly is not reached. Possibly no DHW operation.	→ section 37

section 29 Display codes and other symptoms

Display code							LED on UBA 3	Other symptoms	Diagnosis
	Main display code		Sub-display code		Meaning	Reset required?			
	04		285		**Blocking fault code:**The return temperature sensor (section 1, [**31**]) has measured a current return water temperature higher than 203 °F (95 °C).	No *5) 7)*	Off	The target room temperature possibly is not reached. Possibly no DHW operation.	→ section 37
	1A		316		**Locking fault code:** The flue gas sensor temperature is too high.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 38
	1C		210		**Locking fault code:** The safety temperature switch has measured an excessively high temperature and is open, or no connection is made between contacts 50 and 78 of the UBA 3 mounting base. **CAUTION:** The boiler can have a flue gas thermostat or a connection between contacts 50 and 78 of the UBA 3 mounting base, depending on the boiler type.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 39
	1U		317		**Locking fault code:** The flue gas sensor contacts have shorted.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 40
	1Y		318		**Locking fault code:** The flue gas sensor contacts are open.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 40
	2E		207		**Blocking fault code:** The heating system water pressure is too low and is less than 3 PSI. Neither the boiler nor the pump are started up. As soon as the water pressure of the heating system is 14 PSI or more, the display code 2E 207 will disappear and both the boiler and the pump will start running. As soon as the water pressure of the heating system is less than 6 PSI, the boiler performance for both the heating operation and the DHW mode will be limited.	No	Off	No heating operation and no DHW.	→ section 41
	2F		260		**Blocking fault code:** The supply temperature sensor (section 1, [**24**]) has not measured any heating water temperature increase after a burner start.	No	Off	No heating operation and no DHW.	→ section 37
	2F		271		**Operating code blocking fault code:** The temperature difference of the heating water measured between the supply (section 1, [**24**]) and safety temperature sensors (section 1, [**28**]) is too much.	No	Off	No heating operation and no DHW.	→ section 37
	2L		266		**Locking fault code:** The pressure sensor (section 1, [**30**]) failed to measure a pressure increase on the heating side during any of four attempts.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 42
	2P		212		**Blocking fault code:** The supply temperature sensor (section 1, [**24**]) has measured a heating water temperature increase of more than 9 °F/sec (5 °C/sec).	No *5) 7)*	Off	No heating operation and no DHW.	→ section 37
	2U		213		**Blocking fault code:** The temperature difference measured between the supply temperature sensor (section 1, [**24**]) and the return temperature sensor (section 1, [**31**]) is more than 90 °F (50 °C).	No *5) 7)*	Off	No heating operation and no DHW.	→ section 37
	2Y		281		**Operating code:**The pump speed was found to be too high or too low while starting up 0U. The modulating function of the pump is switched off. The pump continues to run, but the pump speed is fixed.	No	Off	No heating operation and no DHW.	→ section 43
	2Y		282		**Operating code:** The tacho signal of the pump is missing.	No	Off	No heating operation and no DHW.	→ section 44

section 29 Display codes and other symptoms

Display code							LED on UBA 3	Other symptoms	Diagnosis
	Main display code		Sub-display code		Meaning	Reset required?			
	3A		264		**Blocking fault code:** The fan unit tacho signal (section 1, [**20**]) or the fan unit voltage has failed during the operating phase.	No	Off	No heating operation and no DHW.	→ section 45
	3C		217		**Locking fault code:** The fan unit (section 1, [**20**]) is running irregularly while starting up.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 46
	3F		273		**Blocking fault code:** the boiler has been switched off for a couple of seconds, since it had been operational for 24 hours. This is a safety check.	No *5) 7)*	Off		→ section 47
	3L		214		**Locking fault code:** The fan unit tacho signal (section 1, [**20**]) or the fan unit main voltage is not available during the pre-operative phase 0C.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 45
	3P		216		**Locking fault code:** The fan unit (section 1, [**20**]) is running too slowly.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 48
	3Y		215		**Locking fault code:** The fan unit (section 1, [**20**]) is running too fast.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 49
	4A		218		**Locking fault code:** The supply temperature sensor (section 1, [**24**]) has measured a heating supply temperature higher than 221 °F (105 °C).	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 37
	4C		224		**Locking fault code:** The safety temperature switch has measured an excessively high temperature and is open, or no connection is made between contacts 22 and 24 of the UBA 3 mounting base. The boiler can have a safety temperature switch or a connection between contacts 22 and 24 of the UBA 3 mounting base, depending on the boiler type.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 50
	4E		278		**Locking fault code:**The sensor test has failed.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 51
	4F		219		**Locking fault code:** The safety temperature sensor (section 1, [**28**]) has measured a supply temperature higher than 221 °F (105 °C).	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 37
	4L		220		**Locking fault code:** The contacts of the safety temperature sensor (section 1, [**28**]) have shorted to each other, the contacts of the safety temperature sensor have shorted to ground or the contacts of the safety temperature sensor have measured a supply water temperature of over 266 °F (130 °C).	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 52
	4P		221		**Locking fault code:** The contacts of the safety temperature sensor (section 1, [**28**]) are open.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 53
	4U		222		**Locking fault code:**The contacts of the supply temperature sensor (section 1, [**24**]) have shorted.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 53
	4Y		223		**Locking fault code:** The contacts of the supply temperature sensor (section 1, [**24**]) are open.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 53
	5C *11)*		268		**Operating code:** The Service Tool was connected at the time indicated.	No	Off		
	5H		268 1)		**Operating code:** Component test phase using the Service Tool.	No	Off		
	5H *10)*				**Blocking fault code:** There is no communication between RCC and UBA 3 (section 1, [**32**]).	No	Off	No heating operation.	

section 29 Display codes and other symptoms

Display code							LED on UBA 3	Other symptoms	Diagnosis
	Main display code		Sub-display code		Meaning	Reset required?			
	5L *10)*				**General fault code:** A blocking or locking boiler fault has occurred.	Yes/No	Off flashing 1 Hz	Possibly no heating operation and no DHW.	
	6A		227		**Blocking fault code:** Insufficient flame activity (ionization current) was measured during the first, second or third burner ignition attempt (section 1, [**23**]).	No *5) 7)*	Off		→ section 54
	6A		227		**Locking fault code:** Insufficient flame activity (ionization current) was measured during the fourth burner ignition attempt (section 1, [**23**]).	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 54
	6C		228		**Locking fault code:** Flames (ionization current) were measured after a heat demand occurred, but before opening the gas valve (section 1, [**21**]).	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 55
	6C		306		**Locking fault code:** Flames (ionization current) were detected after switching off the burner (section 1, [**23**]).	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 56
	6L		229		**Blocking fault code:** Insufficient flame activity (ionization current) was measured during the burner procedure.	No *5) 7)*	Off	No heating operation and no DHW.	→ section 57
	6P		269		**Locking fault code:** The glow ignitor (section 1, [**29**]) was activated too long (for more than 10 minutes).	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 58
	7C		231		**Locking fault code:** The power supply was interrupted during a locking fault 4A, 218, 4C, 224, 4E, 278, 4F, 219, 4L, 220, 4U, 222 or 44, 223.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 59
	7H		328		**Blocking fault code:** The main voltage has briefly been interrupted.	No *5) 7)*	Off		→ section 60
	7L		261		**Locking fault code:** The UBA 3 (section 1, [**32**]) is defective.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 66
	7L		280		**Locking fault code:** The UBA 3 (section 1, [**32**]) is defective.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 66
	8Y		232 *1)*		**Operating code:**The external switch contact has opened.		Off	No heating operation and no DHW.	→ section 61
	888				**Operating code:** Display test while starting up, immediately after switching on the main voltage. This code is displayed for a maximum of 1 second.		On		
	9A		235		**Locking fault code:** The KIM is too new for the UBA 3 (section 1, [**32**]).	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 62
	9H		237		**Locking fault code:** The UBA 3 (section 1, [**32**]) or the KIM is defective.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 66
	9H		267		**Locking fault code:** The UBA 3 (section 1, [**32**]) or the KIM is defective.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 66
	9H		272		**Locking fault code:** The UBA 3 (section 1, [**32**]) or the KIM is defective.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 66
	9L		234		**Locking fault code:** The contacts of the gas valve (section 1, [**21**]) are open.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 63
	9L		238		**Locking fault code:** The UBA 3 (section 1, [**32**]) or the KIM is defective.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 66

section 29 Display codes and other symptoms

Display code							LED on UBA 3	Other symptoms	Diagnosis
	Main display code		Sub-display code		Meaning	Reset required?			
	9P		239		**Locking fault code:** The UBA 3 (section 1, [**32**]) or the KIM is defective.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 66
	9U		233		**Locking fault code:** The UBA 3 (section 1, [**32**]) or the KIM is defective.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 66
	A01		800		**Blocking fault code:** The contacts for the outdoor-temperature sensor are open or have shorted.	No	Off	A minimum outdoor temperature of - 40 °F (- 40 °C) is assumed. This may cause the room temperature to be too high.	
	A01		808		**Blocking fault code:** The contacts for the DHW temperature sensor are open or have shorted.	No	Off	Heating operation, but no hot water.	
	A01		809		**Blocking fault code:** The contacts for the DHW temperature sensor 2 are open or have shorted.	No	Off	Heating operation, but no hot water.	
	A01		810		**Blocking fault code:** DHW mode was active for 4 hours without any interruption, while a heat demand occurred as well. The DHW heating system has been switched off after this period of 4 hours, while the boiler is in heating mode.	No	Off	Heating operation, but no hot water.	→ section 64
	A01		811		**Blocking fault code:** Thermal disinfection has been switched off.	No	Off	The tank has not been disinfected.	
	A01		816		**Blocking fault code:** The UBA 3 bus is overloaded.	No	Off	No heating operation and no DHW.	
	A01		828		**Blocking fault code:** The water pressure indication of the heating system does not work.	No	Off	No heating operation and no DHW.	→ section 65
	A01		816		**Blocking fault code:** No communication between the room thermostat and the control panel (section 1, [**4**]).	No	Off	The BC10 settings are not shown on the RC thermostat.	
	A11		806		**Blocking fault code:** The room thermostat sensor indicates a fault.	No	Off		
	A11		816		**Blocking fault code:** No communication with the RC35 takes place.	No	Off		
	A11		840		**Blocking fault code:** Select RC35 as one of the heating circuit addresses.	No	Off		
	A11		841		**Blocking fault code:** Activate at least one heating circuit address via the service menu.	No	Off		
	A11		815		**Blocking fault code:** The switch module sensor indicates a fault.	No	Off	Heating system supply temperature at heating circuit addresses too low.	
	A11		816		**Blocking fault code:** No communication with the switch module.	No	Off	The heating circuit pump is run continuously.	
	A18		825		**Blocking fault code:** Two RC room thermostats are connected; they have been assigned the wrong heating circuit addresses.	No	Off		
	A21		816		**Blocking fault code:** There is no communication between heating circuit address 1 and the corresponding room thermostat.	No	Off		
	A22		816		**Blocking fault code:** There is no communication between heating circuit address 2 and the corresponding room thermostat.	No	Off		
	A23		816		**Blocking fault code:** There is no communication between heating circuit address 3 and the corresponding room thermostat.	No	Off		
	A32		807		**Blocking fault code:** The supply temperature sensor of heating circuit address 2 indicates a fault.	No	Off	The mixer is not activated anymore and stays in its last position.	

section 29 Display codes and other symptoms

Display code							LED on UBA 3	Other symptoms	Diagnosis
	Main display code		Sub-display code		Meaning	Reset required?			
	A32		816		**Blocking fault code:**No communication with the mixer module of heating circuit 2. Faulty communication via communication bus.	No	Off	The mixer module is operated in emergency operation mode. The heating circuit pump is run continuously.	
	A33		807		**Blocking fault code:** The supply temperature sensor of heating circuit address 3 indicates a fault.	No	Off		
	A33		816		**Blocking fault code:** No communication with heating circuit address 3 takes place.	No	Off		
	A51		812		**Blocking fault code:** The solar collector module has not been adjusted correctly.	No	Off		
	A51		813		**Blocking fault code:** The solar collector sensor indicates a fault.	No	Off		
	A51		814		**Blocking fault code:** The solar collector sensor indicates a fault.	No	Off		
	A51		816		**Blocking fault code:** No communication with the solar collector module.	No	Off		
	CA		286		**Locking fault code:**The return temperature sensor (section 1, [**31**]) has measured a return water temperature higher than 221 °F (105 °C).	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 37
	CO		288		**Locking fault code:** The pressure sensor contacts (section 1, [**30**]) are open.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 65
	CO		289		**Locking fault code:** The pressure sensor contacts (section 1, [**30**]) have shorted.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 65
	CU		240		**Locking fault code:** The contacts of the return temperature sensor (section 1, [**31**]) have shorted to each other or the contacts of the return sensor have shorted to ground.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 53
	CY		241		**Locking fault code:** The contacts of the return temperature sensor (section 1, [**31**]) are open.	Yes *4) 6) 7) 8)*	flashing 1 Hz	No heating operation and no DHW.	→ section 53
	EL		290		**Blocking fault code:** The UBA 3 (section 1, [**32**]) or the KIM is defective.	no *5) 7)*	Off	No heating operation and no DHW.	→ section 66
	E *9)*		242 to 287		**Locking fault code:** The UBA 3 (section 1, [**32**]) or the KIM is defective.	Yes *4) 6) 7) 8) 9)*	flashing 1 Hz	No heating operation and no DHW.	→ section 66
	H 7				**Operating code:** The heating system water pressure is too low and is less than 12 PSI. A fluctuating current water pressure may be shown (e.g. P0.5). As soon as the water pressure of the heating system is 14 PSI or more, the display code H 7 will disappear. As soon as the water pressure of the heating system is less than 6 PSI, the boiler performance for both the heating operation and the DHW mode will be limited.	No	Off	Possibly no heating operation and no DHW.	→ section 41
	P-.-				**Operating code:** The water pressure of the heating system is beyond the measuring range of the pressure sensor (section 1, [**30**]).	No	Off		→ section 65

section 29 Display codes and other symptoms

Display code							LED on UBA 3	Other symptoms	Diagnosis
	Main display code		Sub-display code		Meaning	Reset required?			
	rE				**Operating code:** Reset is carried out. After pressing the *"Reset"* button this code is displayed for 5 seconds.		Off		

1) Not visible on the control panel
2) Or any random display indication with a permanent dot in the bottom right-hand corner.
3) Or any random display indication with a flashing dot in the bottom right-hand corner.
4) The cause of the fault must be remedied first.
5) This fault code may deactivate again automatically after a specific time (without reset). Heating and DHW are now available once more.
6) The display values, e.g. the heating system water pressure, are also shown as flashing codes.
7) If more faults occur simultaneously, the relevant display codes are shown one after another. If one of these display codes is a flashing display code, the other display codes will also flash.
8) When this boiler fault occurs the pump is activated to run continuously, thus minimizing the risk of the heating system freezing up.
9) E *+ random digit or letter.*
10) Only visible on certain RC room thermostats.
11) Only visible on the Service Tool.

section 30 Diagnosis

You can find a further explanation of the diagnosis in section 6, chapter 1 on page 6.

section 31

	No indication on the display of the BC10 (section 1, [4]).	
Step 1	Does the boiler work normally?	Yes: → Step **2** No: → Step **11**
Step 2.	● Check that there is 7.8 to 15.2 VDC on both contacts 1 and 2 of the connector between the BC10 and the bottom plate of the BC10, see section 124 and section 131.	
Step 3	Is there a voltage?	Yes: → Step **4** No: → Step **8**
Step 4	● Check the contact between the BC10 (section 1,[**4**]) and its slot by pushing on the BC10.	
Step 5	Is there any indication on the BC10 display within a few minutes?	Yes: → Step **6** No: → Step **7**
Step 6	**Diagnosis: There is insufficient contact between the BC10 (section 1, [4]) and its slot.** Action: replace BC10 and/or its slot.	→ Section **67**
Step 7	**Diagnosis: The control panel BC10 is out of order.** Action: Replace BC10. See the Installation and servicing instructions of the BC10.	→ Section **67**
Step 8	● Check the corresponding component of the wire harness, see section 131.	
Step 9	Is the wire harness free of damage?	Yes: → Section **66** No: → Step **10**
Step 10	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 11	● Check that the plug is in the grounded socket.	
Step 12	Is the plug in the grounded socket?	Yes: → Step **14** No: → Step **13**
Step 13	**Diagnosis: The plug is not in the grounded socket.** Action: Insert the plug into the grounded socket, see section 79.	→ Section **67**
Step 14	● Check that the main power switch is in position "1" as indicated in section 80.	
Step 15	Is the main power switch in position “1” (On)?	Yes: → Step **17** No: → Step **16**
Step 16	**Diagnosis: The main power switch is not in position“1” (On).** Action: Turn the main power switch in position "1" (ON), see section 80.	→ Section **67**
Step 17	● Is there 120 VAC on the grounded socket?	
Step 18	Is there 120 VAC on the grounded socket?	Yes: → Step **20** No: → Step **19**
Step 19	**Diagnosis: There is not 120 VAC on the grounded socket.** Action: Remedy the problem in the electrical system.	→ Section **67**
Step 20	● Measure the resistance of the 120 VAC power supply cable.	
Step 21	Is the resistance of the 120 VAC power supply cable within the specified limits?	Yes: → Step **23** No: → Step **22**
Step 22	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 23	● Test the fuse on the rear of the UBA 3 using a multimeter, see section 82.	
Step 24	Is the fuse working correctly?	Yes: → Section **66** No: → Step **25**

section 31 (continued)

Step 25	**Diagnosis: The fuse is defective.** Action: Replace fuse, see section 82.	
Step 26	● Put the main power switch on the BC10 in position "1" (On) as referred to in section 80.	
Step 27	Is there any indication on the BC10 display within a few minutes?	Yes: → Section **67** No: → Step **28**
Step 28	● Turn the main power switch to position “0” (OFF), see section 72.	
Step 29	● Disconnect the following boiler components from the electrical power supply: – pump, see section 88. – fan unit, see section 84, [**1**].	
Step 30	● Check the fuse again. Test the fuse on the rear of the UBA 3 using a multimeter as indicated in section 82.	
Step 31	Is the fuse working correctly?	Yes: → Step **33** No: → Step **32**
Step 32	● Replace the fuse again, see section 82.	
Step 33	● Put the main power switch on the BC10 in position "1" (On), see section 80.	
Step 34	Is there any indication on the BC10 display within a few minutes?	Yes: → Step **44** No: → Step **35**
Step 35	● Use a multimeter to check the power supply cords of the pump (section 89), the fan unit (section 84) and the hot surface ignitor (section 102) for signs of short circuiting.	
Step 36	Are the wires okay?	Yes: → Step **38** No: → Step **37**
Step 37	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part. Replace the fuse again as indicated in section 82.	→ Section **67**
Step 38	● Check the internal electrical resistance of the transformer, see section 120.	
Step 39	Is the internal electrical resistance of the transformer okay?	Yes: → Step **41** No: → Step **40**
Step 40	**Diagnosis: The transformer is defective.** Action: Replace transformer (section 120).	→ Step **54**
Step 41	● Check the power supply cord and the low-voltage cord of the transformer as indicated in section 121.	
Step 42	Are the power supply cord and the low-voltage cord of the transformer okay?	Yes: → Section **66** No: → Step **43**
Step 43	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Step **54**
Step 44	● Turn the main power switch to position “0” (OFF), as indicated in section 72.	
Step 45	● Re-connect the power supply plug to the pump in reverse order.	
Step 46	● Put the main power switch on the BC10 in position "1" (On), see section 80.	
Step 47	Is there any indication on the BC10 display within a few minutes?	Yes: → Step **49** No: → Step **48**
Step 48	**Diagnosis: The pump is defective.** Action: Replace pump, see section 92.	→ Step **54**
Step 49	● Turn the main power switch to position “0” (OFF), as indicated in section 72.	
Step 50	● Re-connect the power supply plug to the fan unit in reverse order.	
Step 51	● Put the main power switch in position "1" (On), see section 80.	
Step 52	Is there any indication on the BC10 display within a few minutes?	Yes: → Section **67** No: → Step **53**
Step 53	**Diagnosis: The fan unit is defective.** Action: Replace the fan unit, see section 86.	→ Step **54**
Step 54	● Replace the fuse again, see section 82.	→ Section **67**

section 32

	For devices with a hot-water supply: no or insufficient DHW; radiators, convectors, etc. may be heated without a heat demand.	
Step 1	● Put the main power switch on the BC10 in position "0" (Off) as referred to in section 70 and put the main power switch in position "1" (on) as indicated in section 80.	
Step 2	● Open a hot-water tap.	
Step 3	● Check to ensure that the hot-water primary supply pipe to the tank warms up.	
Step 4	Does this pipe warm up (to approx. 140 °F (60 °C))?	Yes: → Step **5** No: → Step **15**
Step 5	**Diagnosis: The cause of this fault does not lie with the heating boiler, but with the water supply or hot water tank.**	
Step 6	● Check to see if the cold-water inlet and hot-water outlet have been incorrectly connected to the storage-type water heater.	
Step 7	Are the pipes connected correctly?	Yes: → Step **9** No: → Step **8**
Step 8	**Diagnosis: The pipes have been connected incorrectly.** Action: Connect the pipes correctly.	→ Section **67**
Step 9	● Close the stop tap in the cold-water inlet and open a hot-water tap at random to see if water is still flowing.	
Step 10	Is this the case?	Yes: → Step **11** No: → Step **12**
Step 11	**Diagnosis: The cause is a defective (thermostat-controlled) mixer tap, a thermostat-controlled mixer valve or a short circuit between the hot- and cold-water pipe circuits.** Action: Replace the relevant component or connect the pipes correctly.	→ Section **67**
Step 12	● Check to see if any other **external** part of the drinking-water system is a possible cause.	
Step 13	Is such a cause detected?	Yes: → Step **14** No: → Section **67**
Step 14	**Diagnosis: Another external part of the drinking-water system is a possible cause of the fault.** Action: Take the affected components out of service.	→ Section **67**
Step 15	● Check – the DHW mode [ ] as indicated in section 23; – that the DHW temperature is adjusted to a high enough setting according to section 81; – that the DHW supply has not been shut off by the timer-switch program of the RC regulator. Consult the operating instructions of the RC regulator.	
Step 16	Are the settings okay?	Yes: → Step **18** No: → Step **17**
Step 17	**Diagnosis: The settings are not OK.** Action: Adjust the settings.	→ Section **67**
Step 18	● Open the stop tap of the cold water inlet pipe and a hot-water tap.	
Step 19	● Check that the LED "DHW demand" on the BC10 is lit, see section 14, [**11**].	
Step 20	Is the LED lit?	Yes: → Step **27** No: → Step **21**
Step 21	● Check the DHW temperature sensor, see section 93.	
Step 22	Is the DHW temperature sensor okay?	Yes: → Step **24** No: → Step **23**
Step 23	**Diagnosis: The DHW temperature sensor is defective.** Action: Replace the DHW temperature sensor, see section 96.	→ Section **67**
Step 24	● Check the DHW temperature sensor lead as indicated in section 94.	
Step 25	Is the wire okay?	Yes: → Section **66** No: → Step **26**

section 32 (continued)

Step 26	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 27	● Check that the heating boiler starts up to supply hot water according to section 24.	
Step 28	Does the heating boiler start up?	Yes: → Step **30** No: → Step **29**
Step 29	● Check the meaning of the current display code in section 29 and resolve the fault.	→ Section **67**
Step 30	● Check the pump for contamination as instructed in section 91.	
Step 31	Is the pump dirty?	Yes: → Step **32** No: → Step **33**
Step 32	**Diagnosis: The pump is dirty.** Action: Clean pump, see section 91.	→ Section **67**
Step 33	● Check the following elements for contamination and/or damage: - outer flue duct; - air suction tube; - orifice (if present, see section 135); - fan unit; - connection between fan unit and burner; - burner; - heat exchanger; - flue-gas system.	
Step 34	Are the above-mentioned components clean and free of damage?	Yes: → Step **36** No: → Step **35**
Step 35	**Diagnosis: The above components are contaminated or damaged.** Action: Clean and/or replace the relevant components.	→ Section **67**
Step 36	● Check the static and dynamic gas supply pressure as instructed in section 117.	
Step 37	Are the static and dynamic gas supply pressures correct?	Yes: → Step **39** No: → Step **38**
Step 38	**Diagnosis: The static and/or dynamic gas supply pressure are not correct.** If the required static and dynamic gas supply pressures are not detected, consult your gas utility company.	→ Section **67**
Step 39	● Check the gas/air ratio as indicated in section 119.	
Step 40	Is the gas/air ratio okay?	Yes: → Step **42** No: → Step **41**
Step 41	**Diagnosis: The gas/air ratio is not okay**. Action: Adjust the gas/air ratio, see section 119.	→ Section **67**
Step 42	● Check the storage-type water heater for furring "(lime scale build up)".	
Step 43	Does the storage-type water heater furred up?	Yes: → Step **44** No: → Section **66**
Step 44	**Diagnosis: The storage-type water heater is furred up.** Action: Decalcify the storage type water heater.	→ Section **67**

section 33

	For devices with a DHW mode: DHW possibly available, no heating operation. **For devices without a DHW mode: no heating operation.**	
Step 1	● Check that the RC regulator or ON/OFF controller is set to heat demand operation. Consult the operating instructions of the RC regulator or the ON/OFF controller. The RC regulator or ON/OFF controller is automatically set to heat demand operation when the temperature setting is higher than the current temperature.	
Step 2	Is the RC regulator or ON/OFF controller setting high enough?	Yes: → Step **4** No: → Step **3**
Step 3	**Diagnosis: The RC regulator or ON/OFF controller has not been set to heat demand operation.** Action: Increase the setting of the RC regulator or ON/OFF controller as indicated in the Operating instructions for the regulator or controller.	→ Section **67**
Step 4	● Check that the LED "Central heat demand" on the BC10 lights up, see section 14.	

section 33 (continued)

Step 5	Does the LED "Central heat demand" light up?	Yes: → Step **11** No: → Step **6**
Step 6	● Check the ON/OFF controller according to section 114 or the RC regulator according to section 115.	
Step 7	Does the boiler start heating operation within approx. 3 minutes [-H]?	Yes: → Step **8** No: → Step **9**
Step 8	**Diagnosis: The thermostat cable is defective.** Action: Replace thermostat cable.	→ Section **67**
Step 9	**Diagnosis: The ON/OFF controller, the RC regulator or the RCC module, if present, is defective.** Action: Replace ON/OFF controller, RC regulator or RCC module. The RCC module is a suspended connection tray, required for certain RC regulators.	
Step 10	Has the fault been remedied?	Yes: → Section **67** No: → Section **66**
Step 11	● Check that the heating system supply temperature on the BC10 or on the RC regulator or ON/OFF controller has been set high enough as instructed in section 81 or in the operating instructions of the regulator or controller.	
Step 12	Is the heating-system supply temperature adjusted to a high enough setting?	Yes: → Step **13** No: → Step **15**
Step 13	Are enough thermostatic valves open on the radiators, convectors, etc?	Yes: → Step **16** No: → Step **14**
Step 14	**Diagnosis: There are not enough thermostatic valves open on the radiators, convectors etc.** Action: Open more thermostatic valves.	→ Section **67**
Step 15	**Diagnosis: The heating system supply temperature setting is too low.** Action: Increase the heating system supply temperature setting on the BC10 or on the RC regulator or ON/OFF controller as instructed in section 81 or in the operating instructions of the regulator or controller.	→ Section **67**
Step 16	● Check that the boiler performance has been set correctly in accordance with section 23 and 133.	
Step 17	Is the boiler performance setting high enough?	Yes: → Step **19** No: → Step **18**
Step 18	**Diagnosis: The boiler performance setting is too low.** Action: Adjust the boiler performance to a higher setting, see section 23 and 133.	→ Section **67**
Step 19	Is the boiler performance of the wall-mounted condensing gas boiler sufficient to heat the building?	Yes: → Step **21** No: → Step **20**
Step 20	**Diagnosis: The boiler performance is too insufficient.** Action: Install a larger heating boiler.	→ Section **67**
Step 21	Is there a hot-water supply?	Yes: → Step **22** No: → Section **66**
Step 22	● Check the movement of the servomotor of the three-way valve.	
Step 23	Does the servomotor of the three-way valve move?	Yes: → Step **24** No: → Step **27**
Step 24	● Check that the three-way valve has been installed correctly.	
Step 25	Has the three-way valve been installed correctly?	Yes: → Step **33** No: → Step **26**
Step 26	**Diagnosis: The three-way valve has not been installed correctly.** Action: Install the three-way valve in the correct way.	→ Section **67**
Step 27	● Check the three-way valve activation.	
Step 28	Does the activation of the three-way valve work correctly?	Yes: → Step **29** No: → Step **30**
Step 29	**Diagnosis: The servomotor of the three-way valve is defective.** Action: Replace the servomotor of the three-way valve.	→ Section **67**

section 33 (continued)

Step 30	● Check the wiring of the three-way valve.	
Step 31	Is the wiring of the three-way valve okay?	Yes: → Step **36** No: → Step **32**
Step 32	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 33	● Check the interior of the three-way valve for contamination, mechanical obstructions etc.	
Step 34	Is the three-way valve okay?	Yes: → Section **66** No: → Step **35**
Step 35	**Diagnosis: The three-way valve is defective.** Action: Replace the three-way valve.	→ Section **67**
Step 36	● Check the wiring of the three-way valve between the connection tray and the UBA 3 mounting base.	
Step 37	Is the wiring of the three-way valve okay?	Yes: → Section **66** No: → Step **32**

section 34

No pressure indication on the display of the BC10 (section 1, [4]).

Step 1	● Check that the plug-and-socket connection of the pressure sensor is connected. See section 128, [**1**].	
Step 2	Is the plug-and-socket connection okay?	Yes: → Step **4** No: → Step **3**
Step 3	**Diagnosis: The plug-and-socket connection of the pressure sensor is not correct.** Action: Reconnect the plug-and-socket connection, see section 128, [**1**].	→ Section **67**
Step 4	● Check the wiring between the pressure sensor plug and the UBA 3 mounting base by measuring, see section 131.	
Step 5	Is the wiring okay?	Yes: → Step **7** No: → Step **6**
Step 6	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 7	**Diagnosis: The pressure sensor is defective.** Action: Replace the pressure sensor, see section 128.	
Step 8	Has a pressure indication appeared on the display?	Yes: → Section **67** No: → Section **66**

section 35

Operating code: The switch optimization program is activated. This program is activated if there has been a hot water request from an RC regulator or an ON/OFF controller more frequently than once every 10 minutes. This means that the boiler cannot be restarted until at least ten minutes have elapsed since initial startup of the burner.

Step 1	Has the maximum heating system supply temperature setting just been changed?	Yes: → Step **2** No: → Step **3**
Step 2	**Diagnosis: The maximum heating system supply temperature setting has just been changed.** Action: Set the maximum heating system supply temperature to the target value and switch off the power supply to the boiler by removing the plug from the grounded socket and reinserting it.	→ Section **67**
Step 3	Are the service valves open as instructed in section 78?	Yes: → Step **5** No: → Step **4**
Step 4	**Diagnosis: The service valves are closed.** Action: Open the service valves as instructed in section 78.	→ Section **67**
Step 5	● Check that the connections of the room thermostat to the boiler and the room thermostat are correct.	
Step 6	Has the thermostat cable been connected correctly?	Yes: → Step **8** No: → Step **7**
Step 7	**Diagnosis: The thermostat cable has not been installed correctly.** Action: Connect the thermostat cable correctly.	→ Section **67**

section 35 (continued)

Step 8	● Visually check the thermostat cable for breaks and loose contacts, if possible, and measure the electrical resistance using a multimeter.	
Step 9	Is the thermostat cable okay?	Yes: → Step **11** No: → Step **10**
Step 10	**Diagnosis: The thermostat cable is defective.** Action: Replace thermostat cable.	→ Section **67**
Step 11	● Check that enough thermostatic valves are open on the radiators, convectors, etc.	
Step 12	Are enough thermostatic valves open on the radiators, convectors, etc?	Yes: → Step **14** No: → Step **13**
Step 13	**Diagnosis: There are not enough thermostatic valves open on the radiators, convectors etc.** Action: Open more thermostatic valves.	→ Section **67**
Step 14	● Attempt to rectify the fault by temporarily replacing the room thermostat or external temperature-dependent controller.	
Step 15	Has the fault been remedied?	Yes: → Section **67** No: → Section **66**

section 36

Operating code: The supply temperature sensor (section 1, [24]) has detected that the current heating-system supply temperature is higher than the temperature entered at the BC10 (section 1, [4]), or that it is higher than the heating-system supply temperature calculated according to the heating curve, or that it is higher than the heating-system supply temperature calculated for the purposes of DHW supply.

Step 1	● Check that the heating system supply temperature setting on the BC10 is high enough, see section 81.	
Step 2	Has the heating system supply temperature been set correctly on the BC10?	Yes: → Step **4** No: → Step **3**
Step 3	**Diagnosis: The heating system supply temperature setting is too low.** Action: Increase the heating system supply temperature setting on the BC10 or on the RC regulator or ON/OFF controller as instructed in section 81 or in the operating instructions of the regulator or controller.	→ Section **67**
Step 4	Has an RC regulator been set as an external temperature-dependent controller?	Yes: → Step **5** No: → Step **8**
Step 5	● Check that the heating curve of the external temperature-dependent RC regulator has been set high enough as instructed in the operating instructions of the relevant regulator.	
Step 6	Has the heating curve of the external temperature-dependent RC regulator been set high enough?	Yes: → Step **8** No: → Step **7**
Step 7	**Diagnosis: The heating curve setting is too low.** Action: Increase the heating curve setting of the external temperature-dependent RC regulator as instructed in the operating instructions of the relevant regulator.	→ Section **67**
Step 8	● Check that enough thermostatic valves are open on the radiators, convectors, etc.	
Step 9	Are enough thermostatic valves open on the radiators, convectors, etc?	Yes: → Step **11** No: → Step **10**
Step 10	**Diagnosis: There are not enough thermostatic valves open on the radiators, convectors etc.** Action: Open more thermostatic valves.	→ Section **67**
Step 11	● Check that no hot-water tap is dripping and that there is no leakage in the hot-water pipe.	
Step 12	Is a hot-water tap dripping or is there a leakage in the hot-water pipe?	Yes: → Step **13** No: → Step **14**
Step 13	**Diagnosis: The hot-water tap is dripping or the hot-water pipe is leaking.** Action: Fix the dripping hot-water tap or the leakage in the hot-water pipe.	→ Section **67**
Step 14	● Find out whether a hot-water tap or taps have been opened on brief, consecutive occasions.	

section 36 (continued)

Step 15	Have a hot-water tap or taps been opened briefly and consecutively on several occasions?	Yes: → Step **16** No: → Step **17**
Step 16	**Diagnosis: A hot-water tap or taps have been opened briefly and consecutively on several occasions.** Action: Inform the user.	→ Section **67**
Step 17	● Check the electrical resistance of the DHW temperature sensor as indicated in section 93.	
Step 18	Is the electrical resistance of the DHW temperature sensor okay (→ section 134)?	Yes: → Section **66** No: → Step **19**
Step 19	**Diagnosis: The DHW temperature sensor is defective.** Action: Replace the DHW temperature sensor, see section 96.	

section 37

	Blocking fault code: The supply temperature sensor (section 1, [24]) has measured a current heating supply temperature higher than 203 °F (95 °C).
	Blocking fault code: The safety temperature sensor (section 1, [28]) has measured a current supply temperature higher than 203 °F (95 °C).
	Blocking fault code: The return temperature sensor (section 1, [31]) has measured a current return water temperature higher than 203 °F (95 °C).
	Blocking fault code: The supply temperature sensor (section 1, [24]) has not measured any heating water temperature increase after a burner start.
	Operating code blocking fault code: The temperature difference of the heating water measured between the supply (section 1, [24]) and safety temperature sensors (section 1, [28]) is too much.
	Blocking fault code:The supply temperature sensor (section 1, [24]) has measured a heating water temperature increase of more than 9 °F/sec (5 °C/sec).
	Blocking fault code: The temperature difference measured between the supply temperature sensor (section 1, [24]) and the return temperature sensor (section 1, [31]) is more than 90 °F (50 °C).
	Locking fault code:The supply temperature sensor (section 1, [24]) has measured a heating system supply temperature higher than 221 °F (105°C).
	Locking fault code:The safety temperature sensor (section 1, [28]) has measured a heating supply temperature higher than 221 °F (105°C).
	Locking fault code: The return temperature sensor (section 1, [31]) has measured a return water temperature higher than 221 °F (105°C).

Step 1	Are the service valves open as instructed in section 78?	Yes: → Step **3** No: → Step **2**
Step 2	**Diagnosis: The service valves are closed.** Action: Open the service valves, see section 78.	→ Section **67**
Step 3	Is the pressure in the heating system at least 14 PSI?	Yes: → Step **5** No: → Step **4**
Step 4	**Diagnosis: The heating system pressure is too low and is less than 14 PSI.** Action: Fill and bleed the heating system, see section 78.	→ Section **67**
Step 5	● Check that the boiler has been purged correctly, see section 78.	

section 37 (continued)

Step 6	Has the boiler been purged correctly?	Yes: → Step **8** No: → Step **7**
Step 7	**Diagnosis: The boiler has not been properly purged.** Action: Purge the boiler of air, see section 78.	→ Section **67**
Step 8	Are enough thermostatic valves open on the radiators, convectors, etc?	Yes: → Step **10** No: → Step **9**
Step 9	**Diagnosis: There are not enough thermostatic valves open on the radiators, convectors etc.** Action: Open more thermostatic valves.	→ Section **67**
Step 10	● Check the supply, safety and return temperature sensors indicated in section 93.	
Step 11	Are the supply, safety and return temperature sensors okay?	Yes: → Step **26** No: → Step **12**
Step 12	**Diagnosis: The relevant sensor is defective.** Action: Replace the relevant sensor, see section 95.	→ Section **67**
Step 13	● Check the pump for mechanical obstructions as instructed in section 87.	
Step 14	Is the pump blocked?	Yes: → Step **15** No: → Step **16**
Step 15	**Diagnosis: The pump is blocked.** Action: Attempt to start up the pump again as indicated in section 87 or replace the pump as indicated in section 92.	→ Section **67**
Step 16	Is the pump running while the display code is shown?	Yes: → Step **17** No: → Step **20**
Step 17	● Check the pump for contamination as instructed in section 91.	
Step 18	Is the pump dirty?	Yes: → Step **19** No: → Step **29**
Step 19	**Diagnosis: The pump is dirty.** Action: Clean pump, see section 91.	→ Section **67**
Step 20	● Check the pump activation as instructed in section 88.	
Step 21	Is the activation okay?	Yes: → Step **22** No: → Step **23**
Step 22	**Diagnosis: The pump is defective.** Action: Replace pump, see section 92.	→ Section **67**
Step 23	● Check the pump power supply cord as instructed in section 89.	
Step 24	Is the pump power supply cord okay?	Yes: → Section **66** No: → Step **25**
Step 25	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 26	● Check the pump as indicated in section 87.	
Step 27	Is the pump okay?	Yes: → Step **33** No: → Step **28**
Step 28	**Diagnosis: The pump is defective.** Action: Replace the pump, see section 92.	
Step 29	Is this a heating system which can run while fully "sealed", e.g. a heating system with only radiator thermostat valves (TRAs) or zone valves or low loss header?	Yes: → Step **30** No: → Section **66**
Step 30	● Check whether there is a bypass or a low loss header in the heating system which ensures a supply through the boiler at all times.	
Step 31	Is there a bypass or a low loss header in the heating system?	Yes: → Step **33** No: → Step **32**
Step 32	**Diagnosis: There is no bypass, nor a low loss header.** Action: Install a bypass or a low loss header in the heating system.	→ Section **67**

section 37 (continued)

Step 33	● Check the operation of the bypass or the low loss header in the heating system. Adjust a possible bypass to a protection pressure of max. 3.6 PSI (25 kPa).	
Step 34	Is the bypass or the low loss header okay?	Yes: → Section **66** No: → Step **35**
Step 35	**Diagnosis: The bypass or the low loss header is defective.** Action: Replace the bypass or the low loss header.	→ Section **67**

section 38

Locking fault code: The flue gas sensor temperature is too high.

Step 1	● Check the entire flue gas system for obstructions.	
Step 2	Is the flue gas system okay?	Yes: → Step **4** No: → Step **3**
Step 3	**Diagnosis: The flue gas system is obstructed.** Action: Remove the obstruction.	→ Section **67**
Step 4	● Check the heat exchanger for contamination on the flue gas side.	
Step 5	Is the heat exchanger dirty?	Yes: → Step **6** No: → Step **7**
Step 6	**Diagnosis: The heat exchanger is dirty.** Action: Clean the heat exchanger.	→ Section **67**
Step 7	● Check the flue gas sensor as indicated in section 97.	
Step 8	Is the flue gas sensor okay?	Yes: → Section **66** No: → Step **9**
Step 9	**Diagnosis: The flue gas sensor is defective.** Action: Replace the flue gas sensor, see section 99.	→ Section **67**

section 39

Locking fault code: The flue gas thermostat has measured an excessively high temperature and is open, or no connection is made between the contacts 50 and 78 of the UBA 3 mounting base.
Note: The boiler can have a flue gas thermostat or a connection between the contacts 50 and 78 of the UBA 3 mounting base, depending on the boiler type.

Step 1	● Check the connection between contacts 50 and 78 of the UBA 3 mounting base according to section 123 and section 131.	
Step 2	Is the connection okay?	Yes: → Section **66** No: → Step **3**
Step 3	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**

section 40

Locking fault code: The flue gas sensor contacts have shorted.

Locking fault code: The flue gas sensor contacts are open.

Step 1	● Check the flue gas sensor as indicated in section 97.	
Step 2	Is the flue gas sensor okay?	Yes: → Step **4** No: → Step **3**
Step 3	**Diagnosis: The flue gas sensor is defective.** Action: Replace the flue gas sensor, see section 99.	→ Section **67**
Step 4	● Check the wiring of the flue gas sensor, see section 98.	

section 40 (continued)

Step 5	Is the flue gas sensor wiring okay?	Yes: → Section **66** No: → Step **6**
Step 6	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**

section 41

Blocking fault code: The heating system water pressure is too low and is less than 3 PSI. Neither the boiler nor the pump are started up.

As soon as the water pressure of the heating system is 14 PSI or more, the display code 2E 207 will disappear and both the boiler and the pump will start running.

As soon as the water pressure of the heating system is less than 6 PSI, the performance of both the heating operation and the DHW mode will be limited.

Operating code: The heating system water pressure is too low and is less than 12 PSI. A fluctuating current water pressure of the heating system may be shown (e.g. P0.5).

As soon as the water pressure of the heating system is 14 PSI or more, the display code H 7 will disappear.

As soon as the water pressure of the heating system is less than 6 PSI, the performance of both the heating operation and the DHW mode will be limited.

Step 1	● Check that the heating system water pressure measured on the control panel is at least 14 PSI, see section 19.	
Step 2	Is the heating system water pressure measured on the BC10 at least 14 PSI?	Yes: → Step **4** No: → Step **3**
Step 3	**Diagnosis: The water pressure of the heating system is too low.** Action: Fill and bleed the heating system, see section 78.	→ Section **67**
Step 4	**Diagnosis: The pressure sensor is defective.** Action: Replace the pressure sensor, see section 128.	
Step 5	Has the fault been remedied?	Yes: → Section **67** No: → Section **66**

section 42

Locking fault code: The pressure sensor (section 1, pos. 30) failed to measure a pressure increase on the heating side during any of four attempts.

Step 1	● Check the pump for mechanical obstructions as instructed in section 87.	
Step 2	Is the pump blocked?	Yes: → Step **3** No: → Step **4**
Step 3	**Diagnosis: The pump is blocked.** Action: Attempt to start up the pump again as indicated in section 87 or replace the pump as indicated in section 92.	→ Section **67**
Step 4	Is the pump running while 2L is displayed?	Yes: → Step **5** No: → step **15**
Step 5	● Check the pump for contamination as instructed in section 91.	
Step 6	Is the pump dirty?	Yes: → Step **7** No: → Step **8**
Step 7	**Diagnosis: The pump is dirty.** Action: Clean pump, see section 91.	→ Section **67**
Step 8	Is the expansion tank connected to the supply pipe?	Yes: → Step **9** No: → Step **10**
Step 9	**Diagnosis: The expansion tank is connected to the supply pipe.** Action: Connect the expansion tank to the return pipe.	→ Section **67**
Step 10	● Check the pressure sensor for contamination as instructed in section 128.	
Step 11	Is the pressure sensor dirty?	Yes: → Step **12** No: → Step **13**
Step 12	**Diagnosis: The pressure sensor is dirty.** Action: Clean the pressure sensor, see section 128.	→ Section **67**

section 42 (continued)

Step 13	**Diagnosis: The pressure sensor is defective.** Action: Replace the pressure sensor, see section 128.	
Step 14	Has the fault been remedied?	Yes: → Section **67** No: → Section **66**
Step 15	● Check the pump activation as instructed in section 88.	
Step 16	Is the activation okay?	Yes: → Step **17** No: → Step **18**
Step 17	**Diagnosis: The pump is defective.** Action: Replace the pump, see section 92.	→ Section **67**
Step 18	● Check the pump power supply cord as instructed in section 89.	
Step 19	Is the pump power supply cord okay?	Yes: → Section **66** No: → Step **20**
Step 20	**Diagnosis: The power supply cord is defective.** Action: Replace the power supply cord of the pump.	→ Section **67**

section 43

Operating code: The pump speed was found to be too high or too low while starting up 0U. The modulating function of the pump is switched off. The pump continues to run, but the pump speed is fixed.

Step 1	● Check that the pump has been purged correctly, see section 78.	
Step 2	Has the pump been purged correctly?	Yes: → Step **4** No: → Step **3**
Step 3	**Diagnosis: There is air trapped in the pump.** Action: Purge the pump, see section 78.	→ Section **67**
Step 4	● Check the pump for mechanical obstructions as instructed in section 87.	
Step 5	Is the pump blocked?	Yes: → Step **6** No: → Step **7**
Step 6	**Diagnosis: The pump is blocked.** Action: Attempt to start up the pump again as indicated in section 87 or replace the pump as indicated in section 92.	→ Section **67**
Step 7	● Check that the tacho plug of the pump valve has been installed correctly, see section 90.	
Step 8	Has the tacho plug of the pump been installed correctly?	Yes: → Step **10** No: → Step **9**
Step 9	**Diagnosis: The tacho plug of the pump has not been installed correctly.** Action: Install the tacho plug of the pump correctly, see section 90.	→ Section **67**
Step 10	● Check the electrical resistance of the tacho cable of the pump as indicated in section 89.	
Step 11	Is the pump tacho cable okay?	Yes: → Step **13** No: → Step **12**
Step 12	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 13	● Check the pump power supply cord as instructed in section 89.	
Step 14	Is the pump power supply cord okay?	Yes: → Step **15** No: → Step **12**
Step 15	● Check the pump for contamination as instructed in section 87.	
Step 16	Is the pump dirty?	Yes: → Step **17** No: → Step **18**
Step 17	**Diagnosis: The pump is dirty.** Action: Clean the pump, see section 87.	→ Section **67**
Step 18	● Attempt to rectify the fault by temporarily replacing the pump, see section 92.	
Step 19	Has the fault been remedied?	Yes: → Section **67** No: → Section **66**

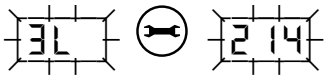
section 44

Operating code: The tacho signal of the pump is missing.

Step 1	● Check that the tacho plug of the pump valve has been installed correctly, see section 90.	
Step 2	Has the tacho plug of the pump been installed correctly?	Yes: → Step **4** No: → Step **3**
Step 3	**Diagnosis: The tacho plug of the pump has not been installed correctly.** Action: Install the tacho plug of the pump correctly, see section 90.	→ Section **67**
Step 4	● Check the electrical resistance of the tacho cable of the pump as indicated in section 89.	
Step 5	Is the pump tacho cable okay?	Yes: → Step **7** No: → Step **6**
Step 6	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 7	● Attempt to rectify the fault by temporarily replacing the pump, see section 92.	
Step 8	Has the fault been remedied?	Yes: → Section **67** No: → Section **66**

section 45

Blocking fault code: The fan unit tacho signal (section 1, [20]) or the fan unit voltage has failed during the operating phase.



Locking fault code: The fan unit tacho signal (section 1, [20]) or the fan unit supply voltage is not available during the pre-operative phase 0C **.**

Step 1	● Check that both plug-and-socket connections of the fan unit are correctly fitted, see section 86, [**2**].	
Step 2	Are the plug-and-socket connections fitted correctly?	Yes: → Step **4** No: → Step **3**
Step 3	**Diagnosis: The plug-and-socket connections have not been installed correctly.** Action: Reconnect the plug-and-socket connections of the fan unit.	→ Section **67**
Step 4	● Check the fan unit activation 120 VAC as indicated in section 83 and section 131.	
Step 5	Is the activation okay?	Yes: → Step **9** No: → Step **6**
Step 6	● Check the fan unit power supply cord (120 VAC) as instructed in section 84.	
Step 7	Is the fan unit power supply cord okay?	Yes: → Section **66** No: → Step **8**
Step 8	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 9	● Check the fan unit tacho cable as indicated in section 85.	
Step 10	Is the tacho cable okay?	Yes: → Step **12** No: → Step **11**
Step 11	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 12	● Check that the main voltage at the grounded plug is between 102 VAC and 132 VAC.	
Step 13	Is the main voltage okay?	Yes: → Step **15** No: → Step **14**
Step 14	**Diagnosis: The main voltage is not OK.** Action: Solve the problem in the electrical system.	→ Section **67**
Step 15	**Diagnosis: The fan unit is defective.** Action: Replace the fan unit, see section 86.	
Step 16	Has the fault been remedied?	Yes: → Section **67** No: → Section **66**

section 46

Locking fault code: The fan unit (section 1, [20]) is running irregularly while starting up.

Step 1	● Attempt to rectify the fault by temporarily replacing the fan unit, see section 86.	
Step 2	Has the fault been remedied?	Yes: → Section **67** No: → Section **66**

section 47

Blocking fault code: The boiler has been switched off for a couple of seconds, since it had been operational for 24 hours. This is a safety check.

Step 1	● Fully switch off the DHW mode and the heat demand and check that the fan unit remains operational after 1 minute.	
Step 2	Is the fan unit still operational?	Yes: → Section **66** No: → Section **67**

section 48

Locking fault code: The fan unit (section 1, [20]) is running too slowly.

Step 1	● Check that the fan unit is not dirty or wet, see section 86.	
Step 2	Is the fan unit dry and clean?	Yes: → Step **4** No: → Step **3**
Step 3	**Diagnosis: The fan unit is dirty or wet.** Action: Clean or replace the fan unit, see section 86.	
Step 4	● Check that the main voltage at the grounded plug is between 102 VAC and 132 VAC.	
Step 5	Is the main voltage sufficient?	Yes: → Step **7** No: → Step **6**
Step 6	**Diagnosis: The main voltage is not OK.** Action: Solve the problem in the electrical system.	→ Section **67**
Step 7	**Diagnosis: The fan unit is defective.** Action: Replace the fan unit, see section 86.	
Step 8	Has the fault been remedied?	Yes: → Section **67** No: → Section **66**

section 49

Locking fault code: The fan unit (section 1, [20]) is running too fast.

Step 1	● Check the plug-and-socket connection of the tacho cable to the fan unit. This is the narrow plug, see section 85, [**2**].	
Step 2	Is the plug-and-socket connection okay?	Yes: → Step **4** No: → Step **3**
Step 3	**Diagnosis: The plug-and socket connection of the tacho cable to the fan unit is loose.** Action: Replace the plug-and-socket connection, see section 86, [**2**].	→ Section **67**
Step 4	● Check the fan unit tacho cable as indicated in section 85.	
Step 5	Is the tacho cable okay?	Yes: → Step **7** No: → Step **6**
Step 6	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 7	● Check that the main voltage at the grounded plug is between 102 VAC and 132 VAC.	
Step 8	Is the main voltage okay?	Yes: → Step **10** No: → Step **9**

section 49 (continued)

Step 9	**Diagnosis: The main voltage is not OK.** Action: Solve the problem in the electrical system.	→ Section **67**
Step 10	● Check that there is no obstruction in the fan unit, burner, heat exchanger or flue-gas system.	
Step 11	Is there an obstruction?	Yes: → Step **12** No: → Step **13**
Step 12	**Diagnosis: There is an obstruction in the fan unit, burner, heat exchanger or flue-gas system.** Action: Remove the obstruction.	→ Section **67**
Step 13	● Check that there is a second fan unit in the flue gas pipe or air inlet system.	
Step 14	Is a second fan unit fitted?	Yes: → Step **15** No: → Step **16**
Step 15	**Diagnosis: A second fan unit has been fitted.** Action: Take the second fan unit out of service.	→ Section **67**
Step 16	● Check that the fan unit wheel has not come loose at the motor spindle, see section 86.	
Step 17	Has the fan unit wheel come loose?	Yes: → Step **18** No: → Step **19**
Step 18	**Diagnosis: The fan unit is defective.** Action: Replace the fan unit, see section 86.	
Step 19	Has the fault been remedied?	Yes: → Section **67** No: → Section **66**

section 50

Locking fault code: The safety temperature switch has measured an excessively high temperature and is open, or no connection is made between the contacts 22 and 24 of the UBA 3 mounting base.
Note: The boiler can have a safety temperature switch or a connection between the contacts 22 and 24 of the UBA 3 mounting base, depending on the boiler type.

Step 1	● Check the connection between contacts 22 and 24 of the UBA 3 mounting base according to section 123 and section 131.	
Step 2	Is the connection okay?	Yes: → Section **66** No: → Step **3**
Step 3	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**

section 51

Locking fault code: The sensor test has failed.

Step 1	● Check the supply and safety temperature sensors and their wiring for short circuits, as instructed in section 93.	
Step 2	Are the supply and safety temperature sensors and their wiring okay?	Yes: → Section **66** No: → Step **3**
Step 3	**Diagnosis: The supply and safety temperature sensors and/or their wiring are defective.** Action: Replace the supply and/or safety temperature sensor as instructed in section 95, the wire harness or the relevant part of the wire harness.	→ Section **67**

section 52

Locking fault code: The contacts of the safety temperature sensor (section 1, [28]) have shorted to each other, the contacts of the safety temperature sensor have shorted to ground or the safety temperature sensor have measured a supply water temperature of over 266 °F (130 °C).

Step 1	Are the service valves open as instructed in section 78?	Yes: → Step **3** No: → Step **2**
Step 2	**Diagnosis: The service valves are closed.** Action: Open the service valves, see section 78.	

section 52 (continued)

Step 3	Is the water pressure of the heating system at least 14 PSI?	Yes: → Step **5** No: → Step **4**
Step 4	**Diagnosis: The water pressure of the heating system is less than 14 PSI.** Action: Fill and bleed the heating system, see section 78.	→ Section **41**
Step 5	Are enough thermostatic valves open on the radiators, convectors, etc?	Yes: → Step **7** No: → Step **6**
Step 6	**Diagnosis: There are not enough thermostatic valves open on the radiators, convectors etc.** Action: Open more thermostatic valves.	→ Section **67**
Step 7	● Check the safety temperature sensor as indicated in section 93.	
Step 8	Is the safety temperature sensor okay?	Yes: → Step **10** No: → Step **9**
Step 9	**Diagnosis: The safety temperature sensor is defective.** Action: Replace the safety temperature sensor, see section 95.	
Step 10	● Check the safety temperature sensor cable as indicated in section 94.	
Step 11	Is the wire okay?	Yes: → Step **13** No: → Step **12**
Step 12	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 13	● Check the pump as indicated in section 87.	
Step 14	Is the pump okay?	Yes: → Section **66** No: → Step **15**
Step 15	**Diagnosis: The pump is defective.** Action: Replace the pump, see section 92.	→ Section **67**

section 53

Locking fault code: The contacts of the safety temperature sensor (section 1, [28]) are open.

Locking fault code:The contacts of the supply temperature sensor (section 1, [24]) have shorted.

Locking fault code: The contacts of the supply temperature sensor (section 1, [24]) are open.

Locking fault code: The contacts of the return temperature sensor (section 1, [31]) have shorted to each other or the contacts of the return temperature sensor have shorted to ground.

Locking fault code: The contacts of the return temperature sensor (section 1, [31]) are open.

Step 1	● Check the supply, safety and return temperature sensors indicated in section 93.	
Step 2	Are the supply, safety and return temperature sensors okay?	Yes: → Step **4** No: → Step **3**
Step 3	**Diagnosis: The supply, safety and or return temperature sensors are defective.** Action: Replace the supply, safety and or return temperature sensors, see section 95.	
Step 4	● Check the cables of the supply, safety and/or return temperature sensors indicated in section 94.	
Step 5	Are the wires okay?	Yes: → Section **66** No: → Step **6**
Step 6	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**

section 54

Blocking fault code: Insufficient flame activity (ionization current) was measured during the first, second or third burner ignition attempt (section 1, [23]).

Locking fault code: Insufficient flame activity (ionization current) was measured during the fourth burner ignition attempt (section 1, [23]).

Step 1	Is the heating system propane gas-fired?	Yes: → Step **2** No: → Step **5**
Step 2	● Contact the gas utility company to check that there is no nitrogen in the new or existing gas tank and the gas supply pipe.	
Step 3	Is there still nitrogen in the new or existing gas tank and the gas supply pipe?	Yes: → Step **4** No: → Step **5**
Step 4	**Diagnosis: There is nitrogen in the gas tank and the gas supply pipe.** Action: Remove the nitrogen in conjunction with the gas utility company.	→ Section **67**
Step 5	● Check that the device gas stop valve is open as instructed in section 81 and that the main gas stop valve is open.	
Step 6	Are both gas stop valves open?	Yes: → Step **8** No: → Step **7**
Step 7	**Diagnosis: The device gas stop valve and/or the main gas stop valve is/are closed.** Action: Open the device gas stop valve as instructed in section 81 and open the main gas stop valve.	→ Section **67**
Step 8	● Check the static and dynamic gas supply pressures as indicated in section 117.	
Step 9	Are the static and dynamic gas supply pressures correct?	Yes: → Step **16** No: → Step **10**
Step 10	● Check that there is no obstruction in the gas pipe between the device gas stop valve and gas valve.	
Step 11	Did you find an obstruction?	Yes: → Step **12** No: → Step **13**
Step 12	**Diagnosis: There is an obstruction in the gas pipe.** Action: Remove the obstruction.	→ Section **67**
Step 13	● Check that there is no obstruction in other parts of the gas pipe.	
Step 14	Did you find an obstruction?	Yes: → Step **15** No: → Step **39**
Step 15	**Diagnosis: There is an obstruction in the gas pipe.** Action: Remove the obstruction.	→ Section **67**
Step 16	Has the gas supply pipe been purged?	Yes: → Step **18** No: → Step **17**
Step 17	**Diagnosis: The gas supply pipe has not been purged.** Action: Bleed the gas supply pipe, see section 118.	→ Section **67**
Step 18	● Check that the glow ignitor activates when the operating code 0C is displayed, see section 100.	
Step 19	Does the glow ignitor activate when the operating code 0C is displayed?	Yes: → Step **23** No: → Step **20**
Step 20	● Check the electrical resistance of the power supply cord of the glow ignitor as indicated in section 102.	
Step 21	Is the power supply cord okay?	Yes: → Section **66** No: → Step **22**
Step 22	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 23	● Check the electrical resistance of the glow ignitor as indicated in section 102.	
Step 24	Is the electrical resistance of the glow ignitor okay?	Yes: → Step **26** No: → Step **25**
Step 25	**Diagnosis: The glow ignitor is defective.** Action: Replace the glow ignitor, see section 103.	→ Section **67**

section 54 (continued)

Step 26	● Put the boiler in operation, see section 19, and check that the glow ignitor activates when the operating code [0C] is displayed.	
Step 27	Does the glow ignitor activate when the operating code [0C] is displayed?	Yes: → Step **28** No: → Step **25**
Step 28	● Connect a digital pressure gauge, see section 119. Open the gas stop valve, see section 81, and put the boiler into operation, see section 20. Check that the gas valve is opened while switching over from the operating code [0C] to the operating code [0L]. The opening of the gas valve while switching over from the operating code [0C] to the operating code [0L] can be recognized by the pressure reading changing to approx. -0.02 inch W.C.	
Step 29	Does the pressure reading change to approx. -0.02 inch W.C. while switching over from the operating code [0C] to the operating code [0L]?	Yes: → Step **43** No: → Step **30**
Step 30	● Check the plug-and-socket connection of the gas valve, see section 109.	
Step 31	Is the plug-and-socket connection okay?	Yes: → Step **33** No: → Step **32**
Step 32	**Diagnosis: The plug-and-socket connection has come loose.** Action: Replace the plug-and-socket connection on the gas valve, see section 109.	→ Section **67**
Step 33	● Check that a voltage is supplied to the gas valve while the operating code [0L] is displayed, see section 110.	
Step 34	Is voltage supplied to the gas valve?	Yes: → Step **35** No: → Step **36**
Step 35	**Diagnosis: The gas valve is defective.** Action: Replace the gas valve, see section 113.	→ Section **67**
Step 36	● Check the gas valve power supply cord as indicated in section 111.	
Step 37	Is the power supply cord okay?	Yes: → Section **66** No: → Step **38**
Step 38	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 39	● Check that the overall gas supply network is of sufficient capacity.	
Step 40	Is the overall gas supply network of sufficient capacity?	Yes: → Step **42** No: → Step **41**
Step 41	**Diagnosis: The gas supply network is not of sufficient capacity.** Action: Increase the capacity of the gas supply network.	→ Section **67**
Step 42	**Diagnosis: The cause of the fault is to be found outside the boiler and the gas pipe.** **The gas supply pressure regulator may be defective.** Action: Contact the gas utility company.	→ Section **67**
Step 43	● Check that the gas/air ratio is approximately -0.02 inch W.C. while switching over from the operating code [0C] to the operating code [0L], see section 119.	
Step 44	Is the gas/air ratio while switching over from the operating code [0C] to the operating code [0L] approximately -0.02 inch W.C.?	Yes: → Step **46** No: → Step **45**
Step 45	**Diagnosis: The gas/air ratio setting is not okay**. Action: Adjust the gas/air ratio, see section 119.	→ Section **67**
Step 46	● Check that the correct orifice has been installed, see section 113 and 135.	
Step 47	Has the correct orifice been installed?	Yes: → Step **49** No: → Step **48**
Step 48	**Diagnosis: The wrong orifice has been installed.** Action: Fit the correct orifice, see section 113 and 135.	→ Section **67**

section 54 (continued)

Step 49	● Check the following elements for contamination, damage and/or incorrect installation: - Siphon, section 127; - Air suction tube, section 1, [**12**]; - Seal and connection between venturi pipe and fan unit; - Venturi pipe, see section 86; - Orifice, see section 113; - Fan unit; - Seal and connection between fan unit and burner; - Burner, section 126; - Heat exchanger; - Flue gas outlet and air inlet system; - Ground wire insulation, see section 108.	
Step 50	Are the above-mentioned components clean, free of damage and/or correctly installed?	Yes: → Step **52** No: → Step **51**
Step 51	**Diagnosis: The above components are dirty, damaged or not correctly installed.** Action: Clean, replace and/or re-install the relevant components.	→ Section **67**
Step 52	● Check the ionization current as indicated in section 104.	
Step 53	Is the ionization current okay?	Yes: → Section **67** No: → Step **54**
Step 54	● Check the plug-and-socket connection between the ionization electrode and wire harness as instructed in section 104.	
Step 55	Is the plug-and-socket connection okay?	Yes: → Step **57** No: → Step **56**
Step 56	**Diagnosis: The plug-and-socket connection has come loose.** Action: Connect the plug-and-socket connection correctly.	→ Section **67**
Step 57	● Check the cable of the ionization electrode as indicated in section 106.	
Step 58	Is the wiring okay?	Yes: → Step **60** No: → Step **59**
Step 59	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 60	● Check the ionization electrode as indicated in section 105 and section 107.	
Step 61	Is the ionization electrode okay?	Yes: → Step **63** No: → Step **62**
Step 62	**Diagnosis: The ionization electrode is defective.** Action: Replace the ionization electrode, see section 103.	→ Section **67**
Step 63	● Temporarily remove the combustion air supply and exhaust gas outlet connections from the top of the device. Put the device into operation as instructed in section 20. **Note**: Ensure that there is sufficient air supply during this test. Check that the fault has been rectified.	
Step 64	Has the fault been remedied?	Yes: → Step **65** No: → Section **66**
Step 65	**Diagnosis: The cause of the fault is to be found in the air inlet/flue gas outlet system.** Action: Switch off the device and remedy the fault.	→ Section **67**

section 55

Locking fault code: Flames (ionization current) were measured after a heat demand occurred, but before opening the gas valve (section 1, [21]).

Step 1	● Check the ionization electrode as indicated in section 105.	
Step 2	Is the ionization electrode okay?	Yes: → Section **66** No: → Step **3**
Step 3	**Diagnosis: The ionization electrode is defective.** Action: Replace the ionization electrode, see section 103.	→ Section **67**

section 56

Locking fault code: Flames (ionization current) have been detected after switching off the burner (section 1, [23]).

Step 1	● Connect a digital pressure gauge, see section 119. Open the gas stop valve, see section 81, and put the boiler into flue gas test mode, see section 20. End the heat demand in accordance with the flue gas test (section 20), wait for the LED "Burner operation" to extinguish and then check that burner pressure is still available (gas/air ratio of -0.02 inch W.C.).	
Step 2	Is burner pressure still available (gas/air ratio of -0.02 inch W.C.)?	Yes: → Step **6** No: → Step **3**
Step 3	● Check the ionization electrode as indicated in section 105.	
Step 4	Is the ionization electrode okay?	Yes: → Section **66** No: → Step **5**
Step 5	**Diagnosis: The ionization electrode is defective.** Action: Replace the ionization electrode, see section 103.	→ Section **67**
Step 6	● Close the gas stop valve as indicated in section 74. Remove the digital pressure gauge and close the gas/air ratio measuring nipple. Open the gas stop valve, see section 81, and put the boiler into operation, see section 20. End the heat demand in accordance with section 20, wait for the LED "Burner operation" to extinguish and then check that there is still a voltage on the gas valve, see section 110.	
Step 7	Is there still a voltage on the gas valve?	Yes: → Section **66** No: → Step **8**
Step 8	**Diagnosis: The gas valve is defective.** Action: Replace the gas valve, see section 113.	

section 57

Blocking fault code: Insufficient flame activity (ionization current) was measured during the burner procedure.

Step 1	Is the heating system propane gas-fired?	Yes: → Step **2** No: → Step **5**
Step 2	● Contact the gas utility company to check that there is no nitrogen in the new or existing gas tank and the gas supply pipework.	
Step 3	Is there still nitrogen in the new or existing gas tank and the gas supply pipework?	Yes: → Step **4** No: → Step **5**
Step 4	**Diagnosis: There is nitrogen in the gas tank and the gas supply pipework.** Action: Remove the nitrogen in conjunction with the gas utility company.	→ Section **67**
Step 5	● Check that the device gas stop valve is open as instructed in section 81 and that the main gas stop valve is open.	
Step 6	Are both gas stop valves open?	Yes: → Step **8** No: → Step **7**
Step 7	**Diagnosis: The device gas stop valve and/or the main gas stop valve is/are closed.** Action: Open the device gas stop valve as instructed in section 81 and open the main gas stop valve.	→ Section **67**
Step 8	● Check the static and dynamic gas supply pressures as indicated in section 117.	
Step 9	Are the static and dynamic gas supply pressures correct?	Yes: → Step **16** No: → Step **10**
Step 10	● Check that there is no obstruction in the gas pipe between the device gas stop valve and gas valve.	
Step 11	Did you find an obstruction?	Yes: → Step **12** No: → Step **13**
Step 12	**Diagnosis: There is an obstruction in the gas pipe.** Action: Remove the obstruction.	→ Section **67**
Step 13	● Check that there is no obstruction in other parts of the gas pipe.	
Step 14	Did you find an obstruction?	Yes: → Step **15** No: → Step **24**

section 57 (continued)

Step 15	**Diagnosis: There is an obstruction in the gas pipe.** Action: Remove the obstruction.	→ Section **67**
Step 16	Has the gas supply pipe (and the gas tank, if relevant) been purged?	Yes: → Step **18** No: → Step **17**
Step 17	**Diagnosis: The gas supply pipe (and the gas tank, if relevant) has not been purged.** Action: Purge the gas supply pipe (and the gas tank, if relevant), see section 118.	→ Section **67**
Step 18	● Check the plug-and-socket connection of the gas valve, see section 109.	
Step 19	Is the plug-and-socket connection okay?	Yes: → Step **21** No: → Step **20**
Step 20	**Diagnosis: The plug-and-socket connection has come loose.** Action: Replace the plug-and-socket connection on the gas valve, see section 109.	→ Section **67**
Step 21	● Check the gas valve power supply cord as indicated in section 111.	
Step 22	Is the power supply cord okay?	Yes: → Step **28** No: → Step **23**
Step 23	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 24	● Check that the overall gas supply network is of sufficient capacity.	
Step 25	Is the overall gas supply network of sufficient capacity?	Yes: → Step **27** No: → Step **26**
Step 26	**Diagnosis: The gas supply network is not of sufficient capacity.** Action: Increase the capacity of the gas supply network.	→ Section **67**
Step 27	**Diagnosis: The cause of the fault is to be found outside the boiler and the gas pipe work.** **The gas supply pressure regulator may be defective.** Action: Contact the gas utility company.	→ Section **67**
Step 28	● Adjust the gas/air ratio, see section 119.	
Step 29	Is the gas/air ratio okay?	Yes: → Step **31** No: → Step **30**
Step 30	**Diagnosis: The gas/air ratio setting is not okay**. Action: Adjust the gas/air ratio, see section 119.	→ Section **67**
Step 31	● Check that the correct orifice has been installed, see section 119 and 135.	
Step 32	Has the correct orifice been installed?	Yes: → Step **34** No: → Step **33**
Step 33	**Diagnosis: The wrong orifice has been installed.** Action: Install the correct orifice, see section 119 and 135.	→ Section **67**
Step 34	● Check the following elements for contamination, damage and/or incorrect installation: - Siphon, section 127; - Air suction tube, section 1, [**12**]; - Seal and connection between venturi pipe and fan unit; - Venturi pipe, see section 86; - Orifice, see section 113; - Fan unit; - Seal and connection between fan unit and burner; - Burner, section 126; - Heat exchanger; - Flue gas outlet and air inlet system; - Ground wire insulation, see section 108.	
Step 35	Are the above-mentioned components clean, free of damage and/or correctly installed?	Yes: → Step **37** No: → Step **36**
Step 36	**Diagnosis: The above components are dirty, damaged or not correctly installed.** Action: Clean, replace and/or re-install the relevant components.	→ Section **67**
Step 37	● Check the ionization current as indicated in section 104.	

section 57 (continued)

Step 38	Is the ionization current okay?	Yes: → Step **54** No: → Step **39**
Step 39	● Check the plug-and-socket connection between the ionization electrode and wire harness as instructed in section 104.	
Step 40	Is the plug-and-socket connection okay?	Yes: → Step **42** No: → Step **41**
Step 41	**Diagnosis: The plug-and-socket connection has come loose.** Action: Connect the plug-and-socket connection correctly.	→ Section **67**
Step 42	● Check the cable of the ionization electrode as indicated in section 106.	
Step 43	Is the wiring okay?	Yes: → Step **45** No: → Step **44**
Step 44	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 45	● Check the ionization electrode as indicated in section 105 and section 107.	
Step 46	Is the ionization electrode okay?	Yes: → Step **48** No: → Step **47**
Step 47	**Diagnosis: The ionization electrode is defective.** Action: Replace the ionization electrode, see section 103.	→ Section **67**
Step 48	● Check whether flue gas is being recirculated by visually checking the boiler for discolouring or temporarily running the boiler without air intake. **Note!** This is only allowed if the conditions in the installation room permit this.	
Step 49	Is flue gas being recirculated?	Yes: → Step **50** No: → Step **51**
Step 50	**Diagnosis: Flue gas is recirculated by the boiler.** Action: Remedy the cause of the recirculation.	→ Section **67**
Step 51	● Temporarily remove the combustion air supply and exhaust gas outlet connections from the top of the device. Put the device into operation as instructed in section 20. **Note:** Ensure that there is sufficient air supply during this test. Check that the fault has been rectified.	
Step 52	Has the fault been remedied?	Yes: → Step **53** No: → Step **54**
Step 53	**Diagnosis: The cause of the fault is to be found in the air inlet/flue gas outlet system.** Action: Switch off the device and remedy the fault.	→ Section **67**
Step 54	● Check whether the fault can be remedied by temporarily replacing the gas valve.	
Step 55	Has the fault been remedied?	Yes: → Step **56** No: → Section **66**
Step 56	**Diagnosis: The gas valve is defective.**	→ Section **67**

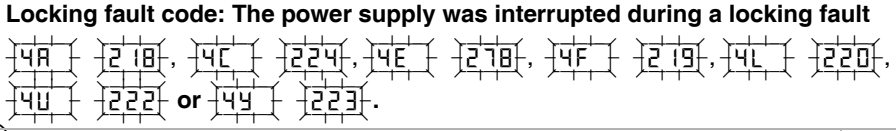
section 58

Locking fault code: The glow ignitor (section 1, [27]) was activated too long (for more than 10 minutes).

Step 1	● Press and hold the "Reset" button for at least 2 seconds.	
Step 2	Has the fault been remedied?	Yes: → Section **67** No: → Step **3**
Step 3	**Diagnosis: The KIM is defective.** Action: Contact the manufacturer. See the back of this document for contact details.	

section 59

Locking fault code: The power supply was interrupted during a locking fault



or

Step 1	● Press and hold the "Reset" button for at least 2 seconds.	
Step 2	Is an error code displayed again?	Yes: → Step **3** No: → Section **67**
Step 3	● Check the meaning of the new fault, see section 29, and resolve the fault.	

section 60

Blocking fault code: The main voltage has been briefly interrupted.

Step 1	● Check whether windmills, generators or other equipment are present which may have caused the main voltage to be interrupted.	
Step 2	Is this the case?	Yes: → Step **3** No: → Step **4**
Step 3	**Diagnosis: The fault is caused by the presence of windmills, generators or other equipment which may cause the main voltage to be interrupted.** Action: Place the affected equipment out of service.	→ Section **67**
Step 4	● Use a main voltage monitoring device to check, over a long period of time, whether the main voltage is actually interrupted briefly.	
Step 5	Has the main voltage actually been briefly interrupted?	Yes: → Step **6** No: → Section **66**
Step 6	**Diagnosis: The cause of the fault lies in the electrical system.** Action: Solve the problem in the electrical system.	→ Section **67**

section 61

Operating code: The external switch contact has opened.

Step 1	● Check that an **external** switch contact has been connected to the device, see section 116.	
Step 2	Is an **external** switch contact connected?	Yes: → Step **9** No: → Step **3**
Step 3	● Check that a connection is present, see section 116.	
Step 4	Is there a connection?	Yes: → Step **6** No: → Step **5**
Step 5	**Diagnosis: There is no connection.** Action: Restore the connection to the connection box, see section 116, [**1**].	→ Section **67**
Step 6	● Check the wire harness between the connection tray and the UBA 3 mounting base according to section 131.	
Step 7	Is the wire harness okay?	Yes: → Section **66** No: → Step **8**
Step 8	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 9	● Check that the fault can be remedied by making a connection, see section 116.	
Step 10	Has the fault been remedied?	Yes: → Step **11** No: → Step **6**
Step 11	**Diagnosis: The external switch contact has opened or a wire has broken in the external switch contact wiring outside the boiler.** Action: Remedy the cause of the external switch contact opening or replace the wiring.	→ Section **67**

section 62

Locking fault code: The KIM is too new for the UBA 3 (section 1, [32]).

Step 1	● Replace the UBA 3 by a UBA 3 provided with the most recent software possible.	
Step 2	Has the fault been remedied?	Yes: → Section **67** No: → Step **3**
Step 3	**Diagnosis: The KIM is too new for the UBA 3.** Measure: Contact the manufacturer. See the back of this document.	→ Section **67**

section 63

Locking fault code: The contacts of the gas valve (section 1, [21]) are open.

Step 1	● Check the plug-and-socket connection of the gas valve, see section 109.	
Step 2	Is the plug-and-socket connection okay?	Yes: → Step **4** No: → Step **3**
Step 3	**Diagnosis: The plug-and-socket connection has come loose.** Action: Replace the plug-and-socket connection, see section 109.	→ Section **67**
Step 4	● Check the electrical resistance of the power supply cord of the gas valve as indicated in section 111.	
Step 5	Is the wire okay?	Yes: → Step **7** No: → Step **6**
Step 6	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 7	● Check the electrical resistance of the gas valve coils as indicated in section 111.	
Step 8	Is the resistance correct?	Yes: → Section **66** No: → Step **9**
Step 9	**Diagnosis: The gas valve is defective.** Action: Replace the gas valve, see section 113.	→ Section **67**

section 64

Blocking fault code: 4 hours of continuous DHW operation, while a heat demand also occurred at the same time. The DHW operation has been switched off after this period of 4 hours, for as long as the boiler is active for the heating operation.

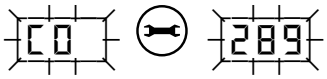
Step 1	● Check that no hot-water tap is dripping and that there is no leakage in the hot-water pipe. This can be checked by feeling whether the hot-water pipe is hot at half a metre below the boiler.	
Step 2	Is a hot-water tap dripping or is there a leakage in the hot-water pipe?	Yes: → Step **3** No: → Step **4**
Step 3	**Diagnosis: The hot-water tap is dripping or the hot-water pipe is leaking.** Action: Fix the dripping hot-water tap or the leakage in the hot-water pipe.	→ Section **67**
Step 4	● Check the electrical resistance of the DHW temperature sensor as indicated in section 93.	
Step 5	Is the electrical resistance of the DHW temperature sensor okay?	Yes: → Step **7** No: → Step **6**
Step 6	**Diagnosis: The DHW temperature sensor is defective.** Action: Replace the DHW temperature sensor, see section 95.	
Step 7	● Check the movement of the servomotor of the three-way valve.	
Step 8	Does the servomotor of the three-way valve move?	Yes: → Step **9** No: → Step **12**
Step 9	● Check that the three-way valve has been installed correctly.	
Step 10	Has the three-way valve been installed correctly?	Yes: → Step **18** No: → Step **11**

section 64

Step 11	**Diagnosis: The three-way valve has not been installed correctly.** Action: Install the three-way valve correctly.	→ Section **67**
Step 12	● Check that the three-way valve is being activated.	
Step 13	Is the three-way valve activated?	Yes: → Step **14** No: → Step **15**
Step 14	**Diagnosis: The servomotor of the three-way valve is defective.** Action: Replace the servomotor of the three-way valve.	→ Section **67**
Step 15	● Check the wiring of the three-way valve.	
Step 16	Is the wiring of the three-way valve okay?	Yes: → Section **66** No: → Step **17**
Step 17	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 18	● Check the interior of the three-way valve for contamination and/or damage.	
Step 19	Is the three-way valve okay?	Yes: → Section **66** No: → Step **20**
Step 20	**Diagnosis: The three-way valve is defective.** Action: Replace the three-way valve.	→ Section **67**

section 65

Locking fault code: The pressure sensor contacts (section 1, [30]) are open.



Locking fault code: The pressure sensor contacts (section 1, [30]) have shorted.

Blocking fault code: The water pressure indication does not work properly.

Operating code: The water pressure of the heating system is beyond the measuring range of the pressure sensor (section 1, [30]).

Step 1	● Check the plug-and-socket connection of the pressure sensor. See section 1, [**30**].	
Step 2	Is the plug-and-socket connection okay?	Yes: → Step **4** No: → Step **3**
Step 3	**Diagnosis: The plug-and-socket connection has come loose.** Action: Renew the plug-and-socket connection.	→ Section **67**
Step 4	● Check the wiring between the pressure sensor plug and the UBA 3 mounting base by measuring the electrical resistance, see section 131.	
Step 5	Is the wiring okay?	Yes: → Step **7** No: → Step **6**
Step 6	**Diagnosis: The wire harness is defective.** Action: Replace the wire harness or the affected part.	→ Section **67**
Step 7	● Use another pressure gauge than the pressure gauge on the control panel to check whether the heating system water pressure measured at the height of the boiler is too high and is more than 83 PSI.	
Step 8	Is the water pressure of the heating system too high?	Yes: → Section **67** No: → Section **66**
Step 9	**Diagnosis: The water pressure of the heating system is too high.** Action: Drain the heating system until the water pressure is approx. 22 PSI.	→ Section **67**
Step 10	**Diagnosis: The pressure sensor is defective.** Action: Replace the pressure sensor, see section 128.	
Step 11	Has the fault been remedied?	Yes: → Section **67** No: → Section **66**

section 66

Poor electrical contacts, UBA 3 defective or KIM defective.

Step 1	**Diagnosis: Poor electrical contacts, UBA 3 is defective or KIM is defective.** Action: Check the contact between: – the UBA 3 and the UBA 3 mounting base by screwing the UBA 3 tightly onto the UBA 3 mounting base; – BC10 and the bottom plate of the BC10 by pushing the BC10 tightly onto the bottom plate; – all other plug-and-socket connections; remedy any contact problems found.	
Step 2	● Press and hold the "(Reset)" button for at least 2 seconds. See section 14.	
Step 3	Is the same fault message shown again?	Yes: → Step **4** No: → Step **7**
Step 4	Has the UBA 3 already been replaced?	Yes: → Step **6** No: → Step **5**
Step 5	**Diagnosis: The UBA 3 is defective.** Action: Replace the UBA 3, see section 130.	→ Step **2**
Step 6	**Diagnosis: The KIM is defective.** Action: Contact the boiler manufacturer before replacing the KIM. See the back of this document for contact details.	
Step 7	Has a new fault occurred?	Yes: → Step **8** No: → Section **67**
Step 8	● Check the meaning of the new fault, see section 29, and resolve the fault.	

section 67

Step 1	● Install the removed components in reverse order of removal.	
Step 2	● Install the boiler casing.	
Step 3	● Put the main power switch on the control panel in position "0" (Off), see section 70.	
Step 4	● Put the main power switch on the control panel in position "1" (On), see section 80.	

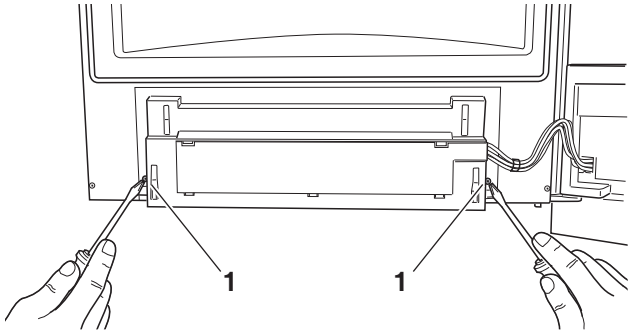
The fault has now been rectified!

The Logamax plus GB162-80 kW/100 kW is working correctly!

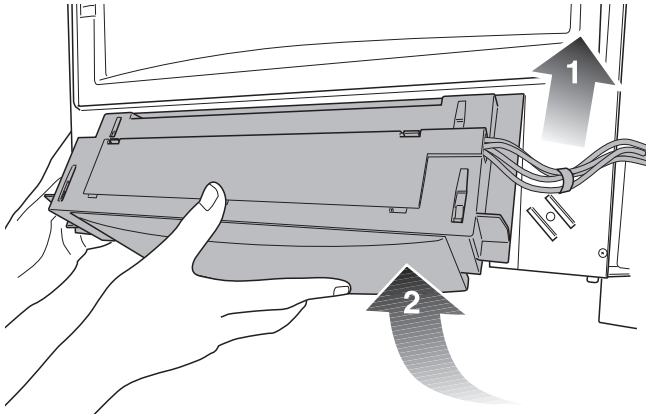
section 68 Hanging the control panel from the boiler

To make it easier to operate the BC10 when the boiler door is open and to make it easier to read the display, the BC10 can be temporarily attached to the boiler in a suspended position. Proceed as follows:

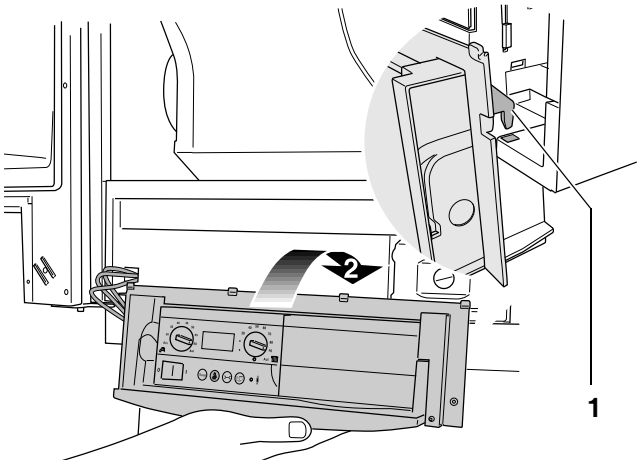
- Put the boiler out of operation, see section 69, 70 and 72.
- Open the door as instructed in section 73.



- Loosen the 2 screws on the back of the door of the BC10 [**1**].

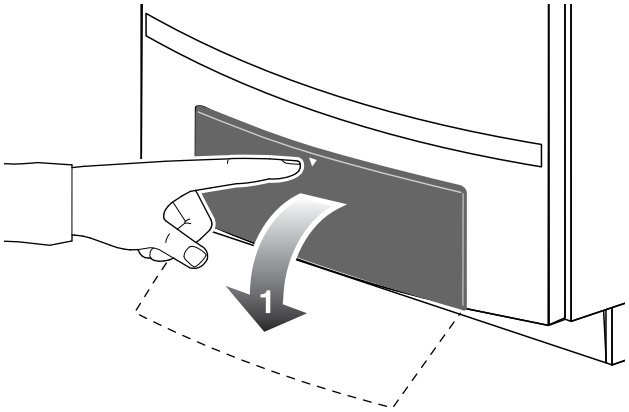


- Remove the cable ties [**1**].
- Remove the basic controller BC10 [**2**].

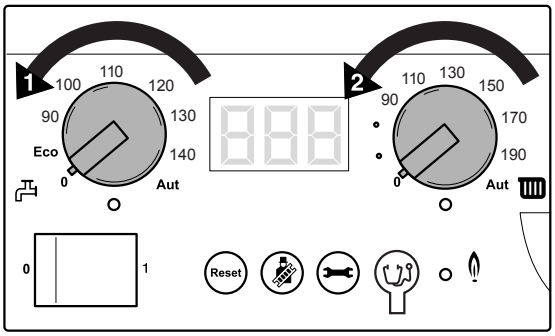


- Hang the BC10 from the boiler [**2**] using the 2 hooks on the left and the right [**1**].
- After completing the service activites, install the BC10 on the boiler door in reverse order of removal and secure the BC10 with the 2 screws.

section 69 Shutting down

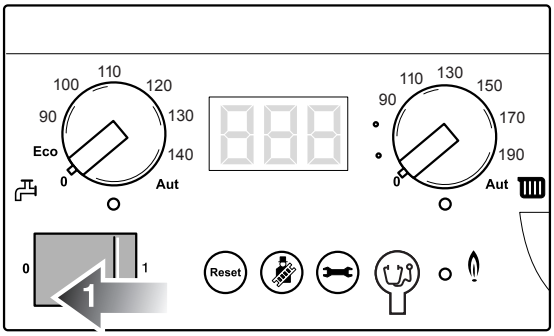


- Open the cover of the BC10 on the front of the boiler [**1**].



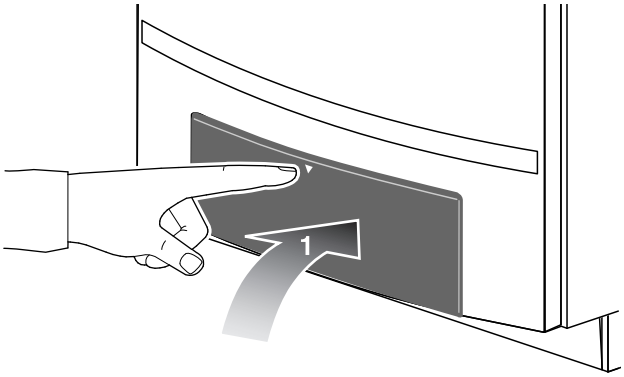
- Put the selector for the DHW temperature setting [**1**] and the selector for the maximum heating-system supply temperature [**2**] in position "0".

section 70 Switching off main power



- Put the main power switch [**1**] on the control panel in position "0" (Off).

section 71 Closing cover of the BC10

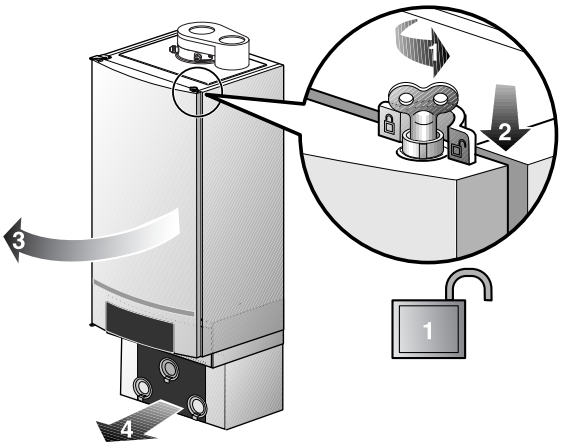


- Close the cover of the BC10 on the front of the boiler [**1**].

section 72 Switching off power supply

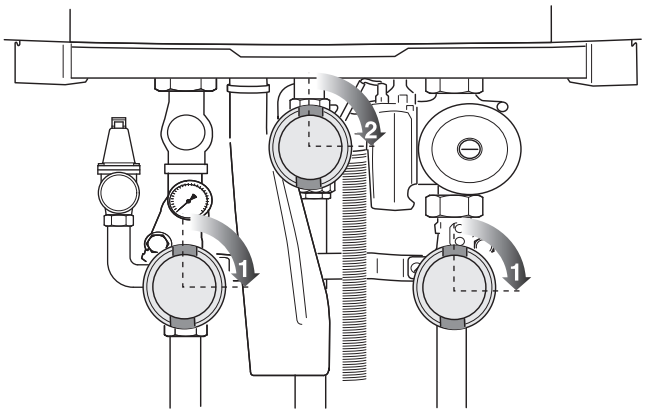
- Switch off the power supply to the heating system.

section 73 Opening boiler door



- Open the door lock by turning it a quarter turn counterclockwise using a bleed key [**1**].
- Push the lock down [**2**] and open the door [**3**].
- If a pump group is available: Remove the casing of the pump group [**4**].

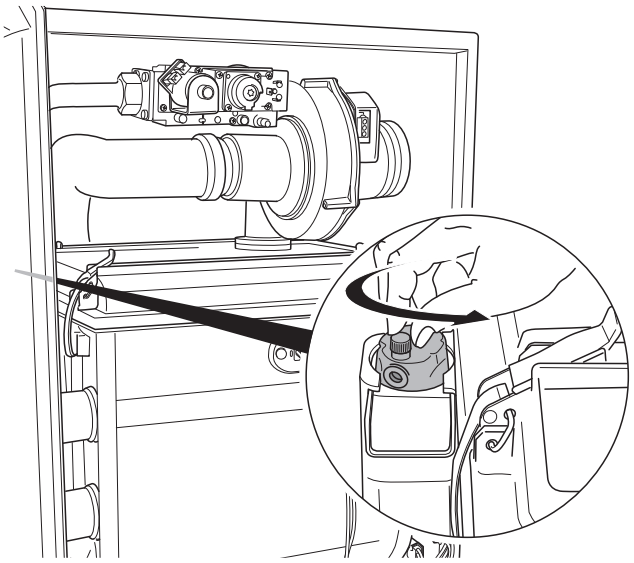
section 74 Closing isolating valves



- If a pump group is available: Close the heating supply and return isolating valves [**1**] by turning them in a clockwise direction (closed position: at a right angle to the pipework).
- If a pump group is available: Close the gas stop valve [**2**] by turning it in a clockwise direction (closed position: at a right angle to the pipework).

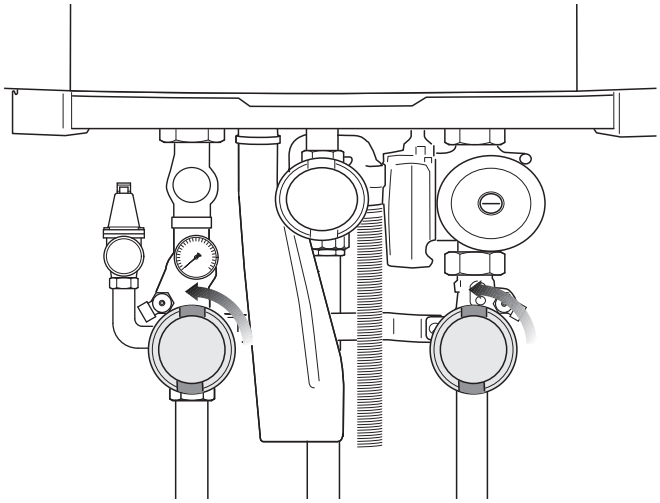
section 75 Draining the system

- Switch off the power supply to the heating system, see section 72.
- If a pump group is available: Remove the casing of the pump group as indicated in section 73.
- Close the service valves if a pump group is available, see section 74, [**1**].



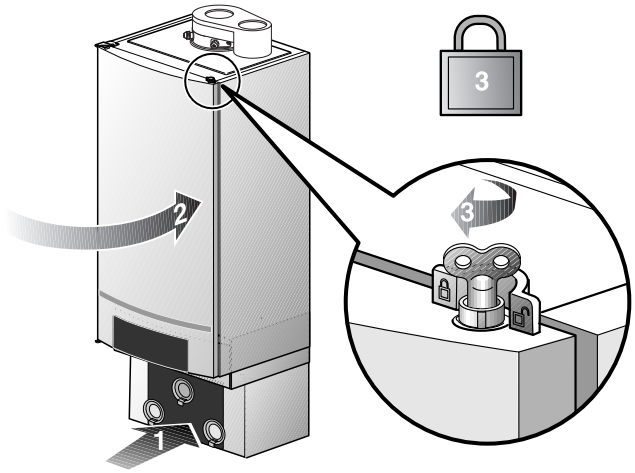
- Loosen the cap on the automatic air purging system located on the top left-hand part of the boiler by turning it through one rotation.
- Remove the cap of the filling and drain valve of the boiler.
- Connect the filling hose to the filling and drain valve of the boiler.

section 76 Opening isolating valves



- If a pump group is available: Open the heating supply and return isolating valves on the pump group (open position: parallel to the pipework).
- Close the heating supply and return isolating valves on the pump group in reverse order.

section 77 Closing boiler door



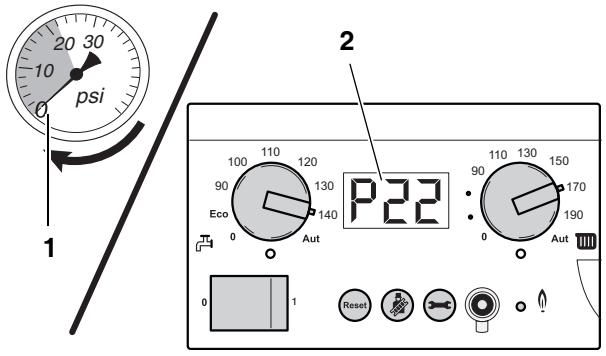
- If a pump group is available: Install the casing of the pump group [**1**] again.
- Close the door [**2**] and then the lock by turning it a quarter turn clockwise using a bleed key [**3**].

section 78 Filling and bleeding the system

- Open the cover of the control panel as instructed in section 69.
- Turn the Space heating water temperature knob [**1**] and DHW temperature knob [**2**] counterclockwise to the "0" position as indicated in section 69.
- Turn the vent key a quarter rotation to undo the boiler door lock and remove the insulation cover of the pump group as instructed in section 73.

To purge the boiler, every radiator in the heating system must have a purge facility. In some situations it may even be necessary to provide extra purging facilities at certain locations.
The boiler itself has an automatic air vent.

- Loosen the cap of the automatic air vent by turning one rotation counterclockwise, see section 75.
- Open the heating supply and return isolating valves on the pump group, see section 76. The open position is parallel to the pipework.
- Fill the heating system to a pressure of about 22 PSI (1.5 bar).

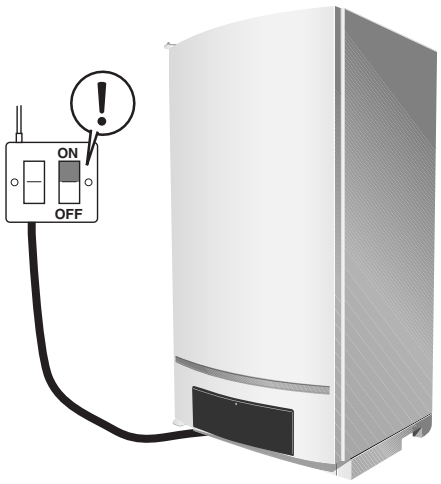


- Read the pressure (PSI) from the pressure gauge [**1**] on the pump group or on the control panel [**2**] of the BC10.

The pressure in the heating system, which is measured directly at the boiler, must be at least equal to the required pre-pressure of the expansion vessel plus 7 PSI (0.5 bar). This minimum pressure must not be less than 12 PSI (0.8 bar) (if the heating system is cold). The maximum pressure in the heating system, measured directly at the boiler, must not exceed 38 PSI (2.6 bar) or 50 PSI (3.5 bar) when the optional 50 PSI (3.5 bar) pressure relief valve is used.

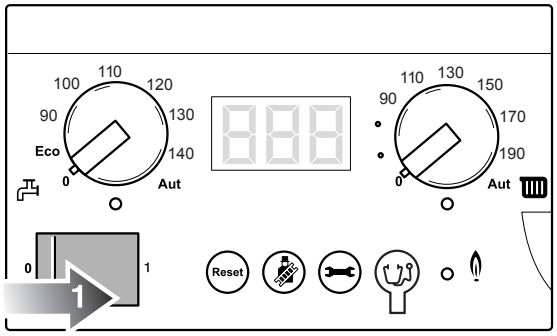
- Purge the heating system via the air vents on the heating bodies. Start at the lowest floor of the premises and then work your way up from floor to floor.

section 79 Switch on power supply

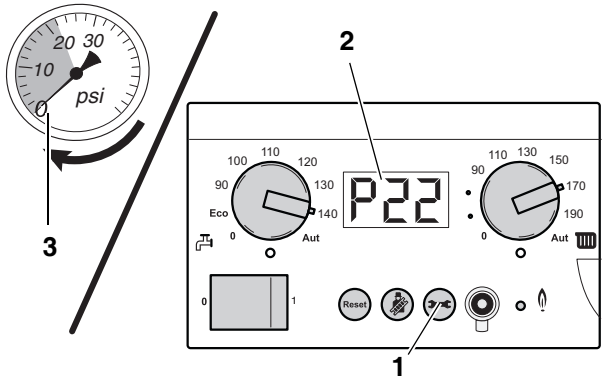


- Switch on the power supply to the heating system.

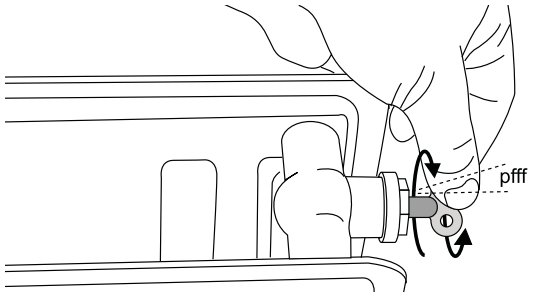
section 80 Switching on main power



- Put the main power switch [**1**] on the control panel in position "1" (On).



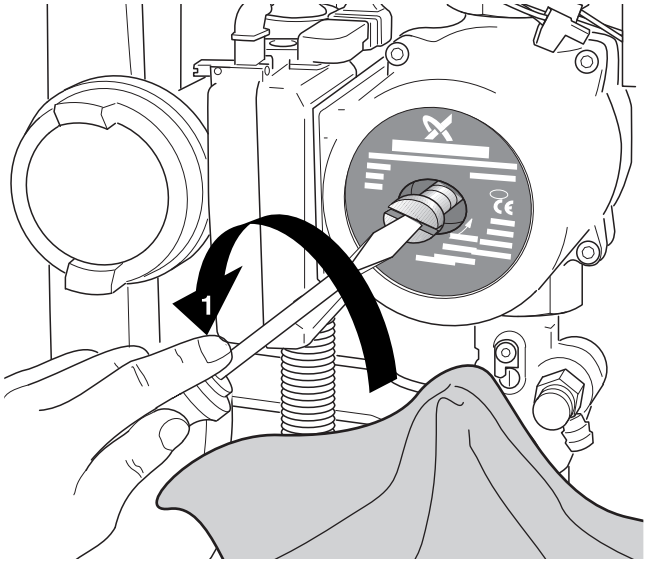
- Press the "Service" button [**1**] a number of times until the pressure is displayed (e.g. P22, [**2**] or read out the pressure from the analog pressure gauge [**3**] in the pump group.



- Purge all radiators in the heating system. Start at the lowest floor of the premises and then work your way up from floor to floor.

If the boiler has been in use for approx. one week and the pressure reading on the display is less than 14 PSI, the system has to be topped up. The pressure loss in a heating system is caused by air bubbles escaping via screw connections and (automatic) air purging units. The oxygen contained in the fresh heating water will also escape from the heating water after some time and cause the water pressure in the heating system to drop.

Should it be necessary to top up the heating system more frequently because the water pressure keeps dropping, water is probably escaping due to a leakage in the heating system or a defective expansion vessel. In this case the cause of the water loss must be removed as soon as possible.



- Drain the pump by removing the vent screw at the front of the pump [**1**].

CAUTION!
Since a little heating water may escape when purging the pump you are advised to lay a dry cloth under the pump.

CAUTION!
Correct purging of the pump will help ensure that it runs for its specified service life. The sliding bearing located behind the vent screw is lubricated by the heating water.

- Check the water pressure of the heating system after all air has been purged from the heating system. If the water pressure is less than 14 PSI, the heating system has to be topped up again as described above.

- Close the water stop valve.
- Close the filling valve on the boiler.
- Disconnect the filling hose.
- Install the cover on the filling valve.
- Open the boiler door and install the casing of the pump group as instructed in section 77.
- Adjust the set buttons on the control panel to the target value, see section 81.
- Close the cover of the BC10 on the front of the boiler as instructed in section 71.

section 81 Initial startup

FOR YOUR SAFETY READ BEFORE OPERATING

WARNING: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand,

B. BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instruction.
- If you cannot reach your gas supplier, call the fire department.

C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

D. Do not use this appliance if any parts have been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

OPERATING INSTRUCTIONS

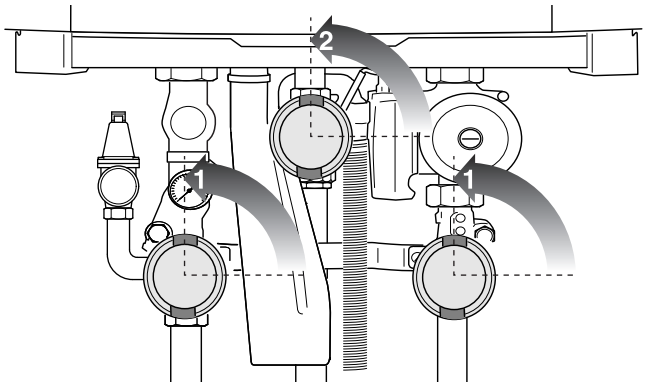
1. STOP! read the safety information above on this label.
2. Turn off all electric power to the appliance.
3. Set the thermostat or other operating control to lowest setting.
4. This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
5. Close main gas shut off valve.
6. Wait (5) minutes to clear out any gas. Then smell for gas. Including near the floor. If you smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.
7. Open main shut off valve.
8. Set the thermostat or other operation control to desired setting.
9. Turn on all electric power to the appliance.
10. If the appliance will not operate, follow the instruction "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

TO TURN OFF GAS TO APPLIANCE

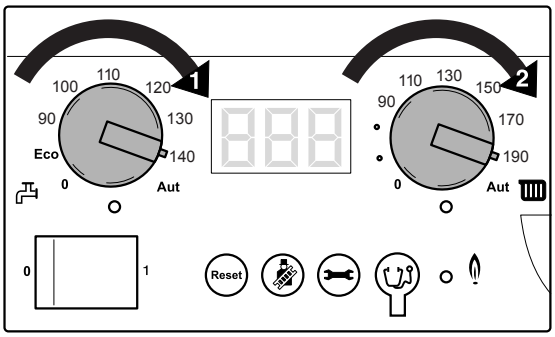
1. Turn off all electric power to the appliance if service is to be performed.
2. Set the thermostat or other operating control to lowest setting.
3. Close main gas shut off valve.

708.375A - 2172B

- Open the boiler door and remove the casing of the pump group as instructed in section 73.



- Open both service valves [**1**].
- Open the gas stop valve [**2**].
- Open the cover of the BC10 on the front of the boiler as instructed in section 69.

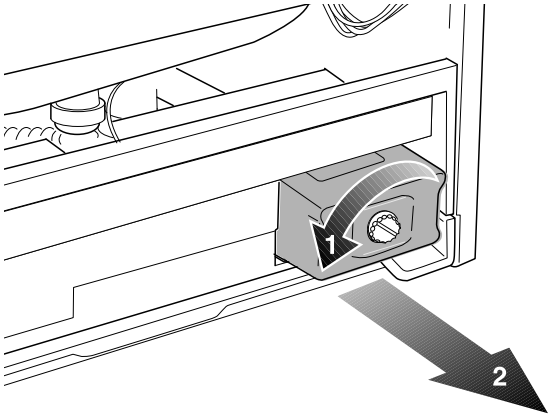


- Put the selector for the DHW temperature setting [**1**] and the selector for the maximum heating-system supply temperature [**2**] on the control panel in the required position.
- Switch on the power supply to the heating system, see section 79.
- Put the main power switch on the BC10 in position "1" (On), see section 80.
- Close the cover of the BC10 on the front of the boiler, see section 71.
- Open the boiler door and install the casing of the pump group, see section 77.

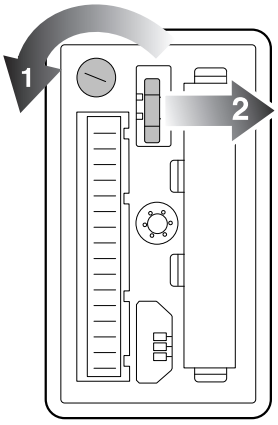
section 82 Checking/replacing fuses

DANGER OF FATAL ACCIDENT
due to electric shock!

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.



- Undo the mounting screw [**1**] of the UBA 3.
- Remove the UBA 3 by moving it in the direction indicated by the arrow [**2**]).



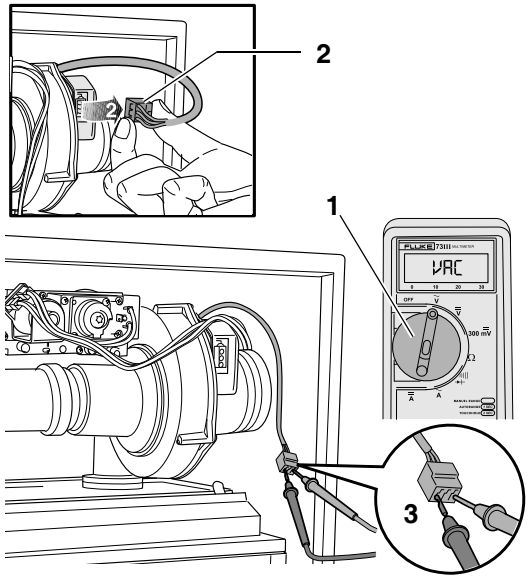
- Remove the fuse holder by turning the bayonet connector [**1**] in a counterclockwise direction, using a flat-head screwdriver.
- Remove the fuse from the fuse holder.
- Measure the fuse using a multimeter. If the fuse has an infinite electrical resistance, it is defective.
- Replace the defective fuse with a (new) 5 AT [**2**] spare fuse.
- Install the UBA 3 burner automat in reverse order of removal.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 83 Checking the fan unit; operation (120 VAC)

DANGER OF FATAL ACCIDENT
due to electric shock!

DAMAGE TO THE INSTALLATION!
To prevent damage, do not insert the multimeter measuring electrodes too far into the holes of the plug-and-socket connection.

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.



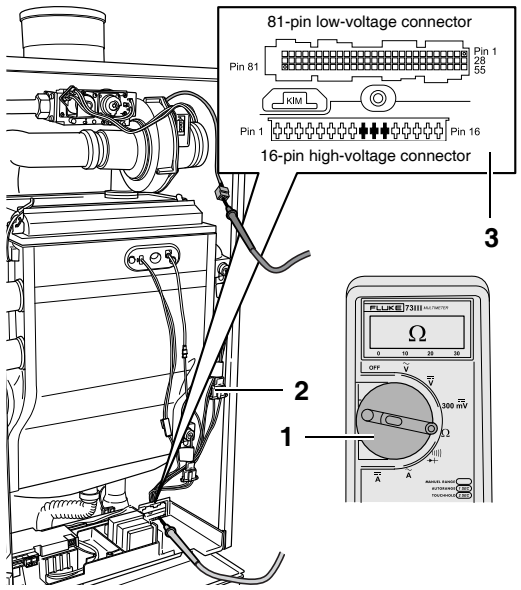
- Set the multimeter to VAC [**1**].
  Minimum measuring range: 250 VAC.
- Remove the 120 VAC plug [**2**] from the fan unit.
- Connect the multimeter to the two outer contacts (blue and brown) of the fan unit power supply plug [**3**].
- Switch on the power supply to the heating system, see section 79.
- Put the main power switch on the control panel in position "1" (On), see section 80.
- Put the boiler in flue gas test mode, see section 20.
- Check whether, with operating code 0C active, there is a voltage of 120 VAC at the two outer contacts (blue and brown) of the plug.
- Switch off the power supply to the heating system, see section 72.
- Connect the fan unit power supply plug in reverse order.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see, section 79.

section 84 Checking the fan unit; power supply cord (120 VAC)

DANGER OF FATAL ACCIDENT
due to electric shock!

DAMAGE TO THE INSTALLATION!
To prevent damage, do not insert the multimeter measuring electrodes too far into the holes of the plug-and-socket connection.

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.
- Remove the UBA 3 burner automat as instructed in section 82.
- Remove the cover from the connection tray, see section 114.



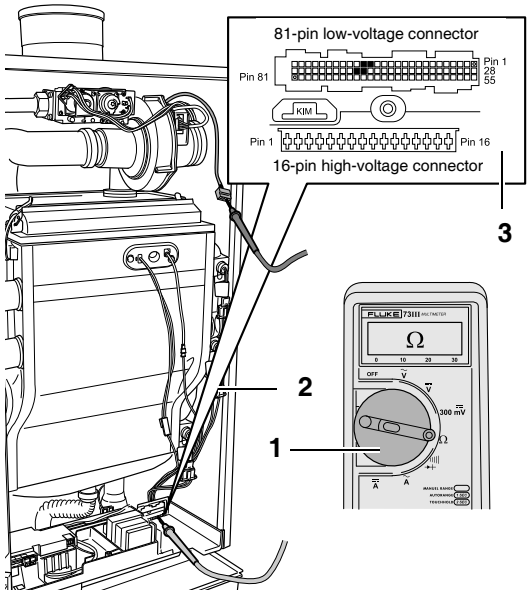
- Undo the fan unit power supply cord plug as instructed in section 86, [**1**].
- Set the multimeter to "Measure resistance" [**1**].
- Check the power supply cord of the fan unit for breaks. The electrical resistance measured separately for every wire must be approx. 0 Ω [**2**]. Measure between the plug and the black contacts (high-voltage connector pins 9, 10 and 11) on the UBA 3 mounting base [**3**].
- Check the power supply cord of the fan unit for internal short circuiting. The electrical resistance, measured between two random wires, must be infinite. See also section 131.
- Remove the multimeter.
- Connect the fan unit power supply plug in reverse order.
- Install the UBA 3 burner automat in reverse order of removal.
- Install the lid on the connection tray in reverse order.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 85 Checking the fan unit; tacho cable

DANGER OF FATAL ACCIDENT
due to electric shock!

DAMAGE TO THE INSTALLATION!
To prevent damage, do not insert the multimeter measuring electrodes too far into the holes of the plug-and-socket connection.

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.
- Remove the UBA 3 as instructed in section 82.
- Remove the cover from the connection tray, see section 114.



- Remove the tacho cable plug, see section 86, [**2**].
- Set the multimeter to "Measure resistance" [**1**].
- Connect the multimeter.
- Check the fan unit tacho cable for breaks. The electrical resistance measured separately for every wire must be approx. 0 Ω [**2**]. Measure between the plug and the black contacts (low-voltage connector pins 16, 17, 44 and 45) on the UBA 3 mounting base [**3**].
- Check the fan unit tacho cable for internal short circuiting. The electrical resistance, measured between two random wires, must be infinite. See also section 131.
- Remove the multimeter.
- Connect the tacho cable plug in reverse order.
- Install the UBA 3 in reverse order of removal.
- Install the lid on the connection tray in reverse order.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

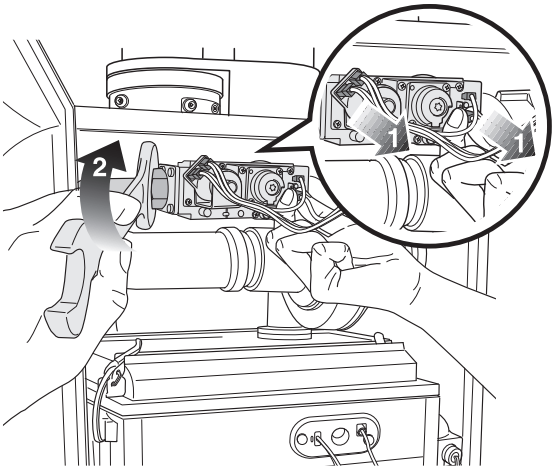
section 86 Checking and/or replacing the fan unit

DANGER OF FATAL ACCIDENT
due to electric shock!

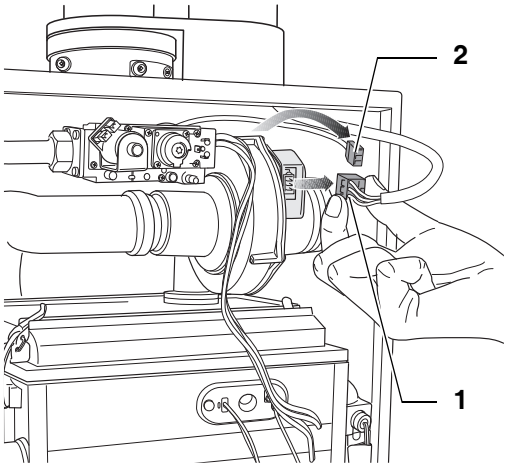
DANGER OF FATAL ACCIDENT/FIRE
from explosive fumes.
All work on gas pipes and fittings must be carried out by authorized gas technicians.

- While carrying out these activities check all sealing rings and gaskets for damage, deformation and signs of aging and replace if required.
- After carrying out these activities, check the system for leaks on the gas side and/or the flue gas side.

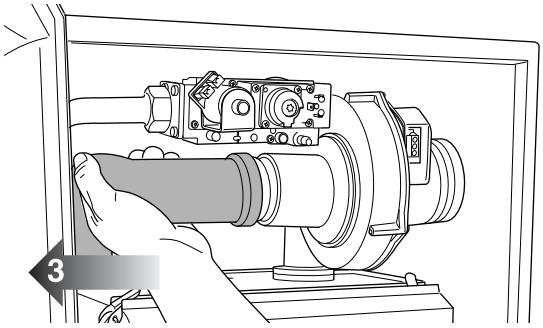
- Take the boiler out of operation, see section 72 and 73.
- Close the gas stop valve as indicated in section 74.



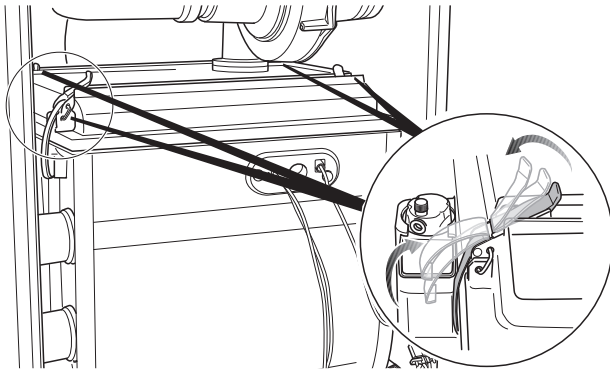
- Remove the power supply plug(s) of the gas regulation valve [**1**].
- Undo the union from the gas supply [**2**].



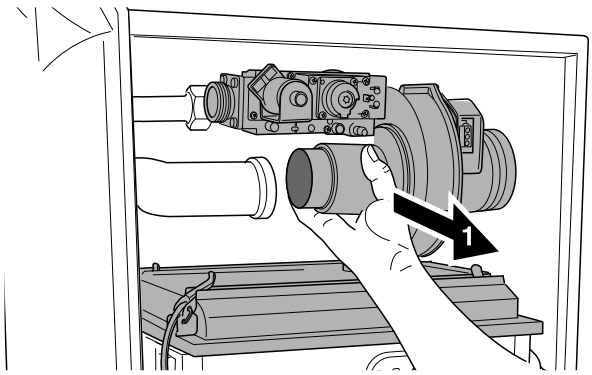
- Remove both the fan unit power supply cord plug [**1**] and the fan unit tacho cable plug [**2**].



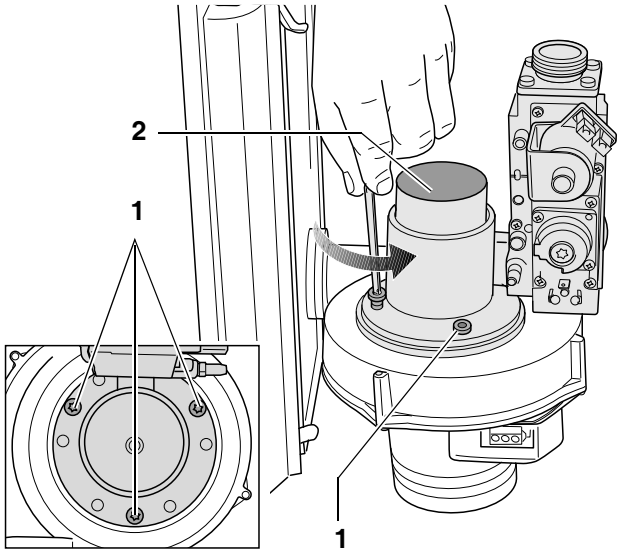
- Pull the air suction pipe from the venturi pipe [**3**].



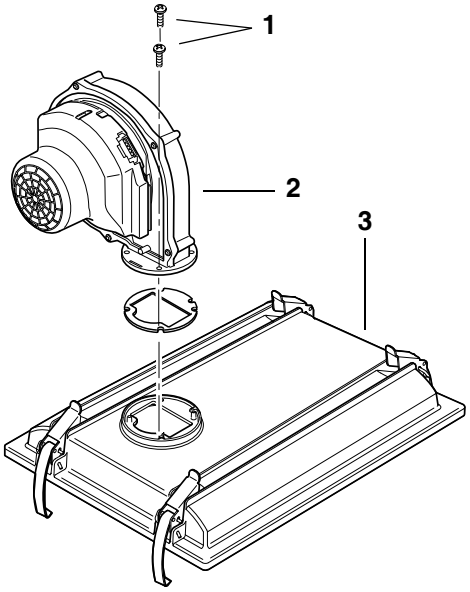
- Open the 4 snap closures of the burner cover.



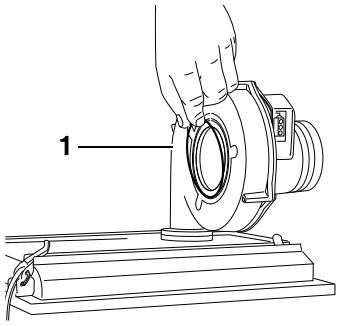
- Remove the gas/air unit including the burner cover [**1**] by moving it in the direction indicated by the arrow.



- Loosen the torx screws [**1**] and remove the gas valve including the venturi pipe [**2**] from the fan unit.
- Check that the fan unit is not dirty or wet; clean or dry it if required.
- Check that the fan unit wheel has not come loose at the motor spindle,



- Loosen the two torx screws [**1**] and remove the fan unit [**2**] from the burner cover [**3**].
- Install the new fan unit in reverse order on the burner cover.



- If necessary, replace the O-ring between the fan unit and the venturi pipe [**1**]. Install the new O-ring in the fan unit and then install the venturi pipe including the gas valve on the fan unit, in reverse order of removal.
- Install the gas/air unit including the burner cover on the heat exchanger, in reverse order of removal.
- Install the air suction pipe on the fan unit.
- Re-connect the gas supply to the gas valve. Ensure when doing so that the flat rubber sealing ring is correctly fitted.
- Fit the power supply plug or plugs to the gas valve and to the fan unit and fit the tacho cable plug to the fan unit.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 87 Checking the pump; mechanical obstruction

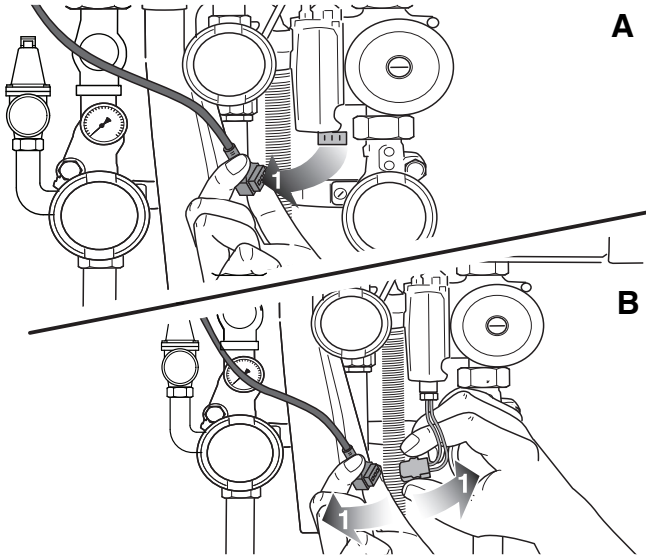
- Remove the casing of the pump group as indicated in section 73.
- Open the cover of the BC10 as instructed in section 69.
- Loosen the vent screw on the front of the pump, see section 80.
- Put the boiler in flue gas test mode, see section 20.
- Check that the pump is running while operating code 0C is displayed or while the locking fault code 2L 266 is displayed. The locking fault code may be displayed after appr. 4 minutes. The pump may become mechanically blocked if the boiler has been out of use for an extended period.
- In this event, attempt to start the pump again using a screwdriver. Use the screwdriver to turn the pump rotor in the direction of rotation shown on the pump identification plate.
- Stop the flue gas test, see section 20.
- Install the vent screw on the pump in reverse order.
- Install the casing of the pump group as indicated in section 77.
- Close the cover of the BC10 in reverse order.

section 88 Checking the pump; activation

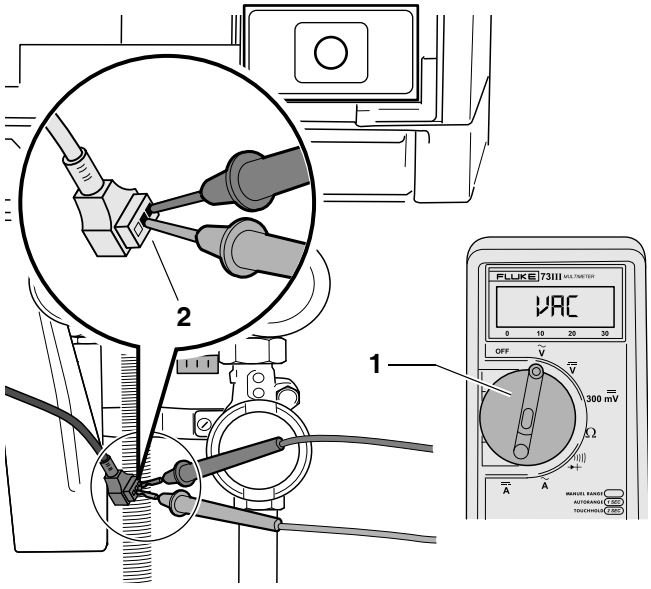
DANGER OF FATAL ACCIDENT
due to electric shock!

DAMAGE TO THE INSTALLATION!
To prevent damage, do not insert the multimeter measuring electrodes too far into the holes of the plug-and-socket connection.

- Switch off the power supply to the heating system, see section 72.
- Remove the casing of the pump group as indicated in section 73.



- Undo the pump power supply cord plug as instructed in **A**, [**1**] and **B**, [**1**].

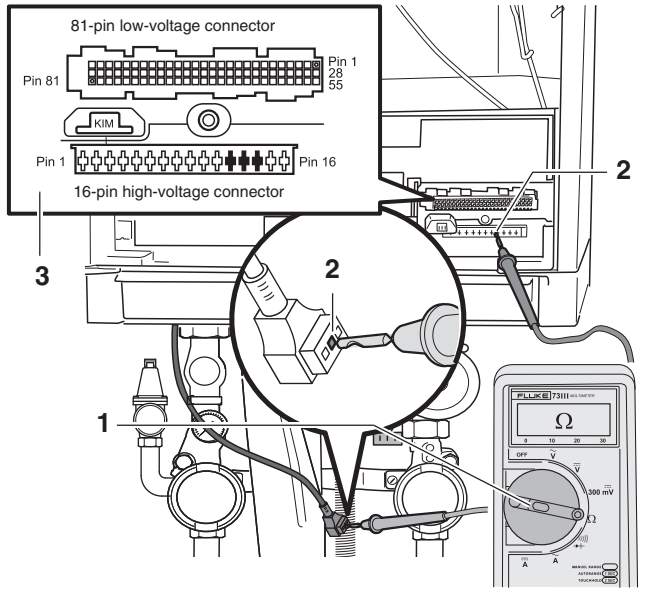


- Set the multimeter to "Measure AC voltage". Minimum measuring range 250 VAC [**1**].
- Switch on the power supply to the heating system, see section 79.
- Put the boiler in flue gas test mode, see section 20.
- Check that there is 120 VAC on the two contacts (L and N) of the pump power supply cord plug while operating code 0C is displayed or while the locking fault code 2L 266 is displayed. The locking fault code may be displayed after appr. 4 minutes.
- Stop the flue gas test as instructed in section 20.
- Attach the pump power supply cord plug.
- Install the casing of the pump group in reverse order of removal.

section 89 Checking the pump; power supply cord

DANGER OF FATAL ACCIDENT
due to electric shock!

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door and remove the casing of the pump group as instructed in section 73.
- Remove the UBA 3 as instructed in section 82.
- Remove the cover from the connection tray, see section 114.
- Pull the supply cord plug from the pump as instructed in section 88.



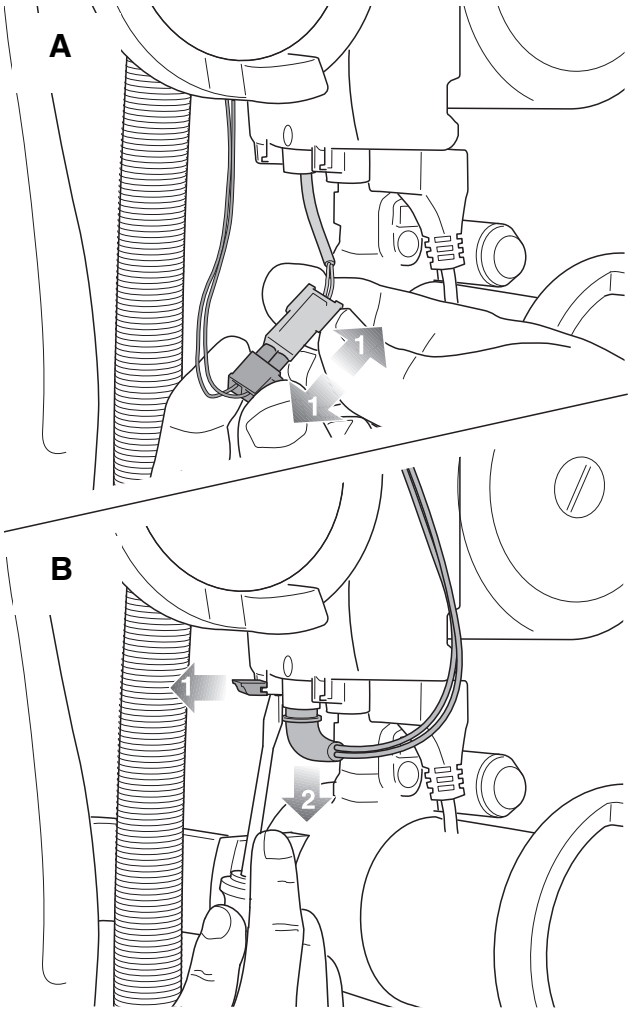
- Set the multimeter to "Measure resistance" [**1**].
- Connect the multimeter [**2**].
- Check the power supply cord of the pump for breaks. The electrical resistance measured separately for every wire must be approx. 0 Ω [**2**].
- Check the power supply cord of the pump for internal short circuiting. The electrical resistance, measured between two random wires, must be infinite. Measure between the plug and the black contacts (high-voltage connector pins 12, 13 and 14) on the UBA 3 mounting base [**3**].
- Attach the pump power supply cord plug in reverse order of removal.

- Install the lid on the connection tray in reverse order.
- Install the UBA 3 in reverse order of removal.
- Close the boiler door and install the casing of the pump group in reverse order of removal.
- Switch on the power supply to the heating system, see section 79.

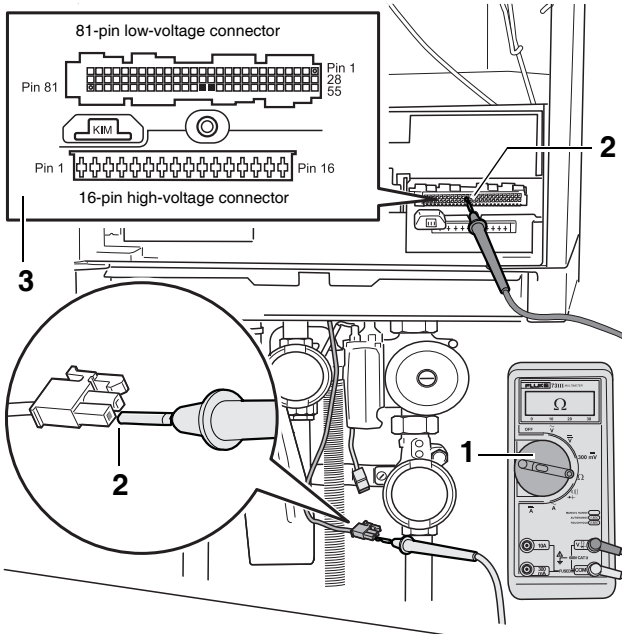
section 90 Checking the pump; tacho cable

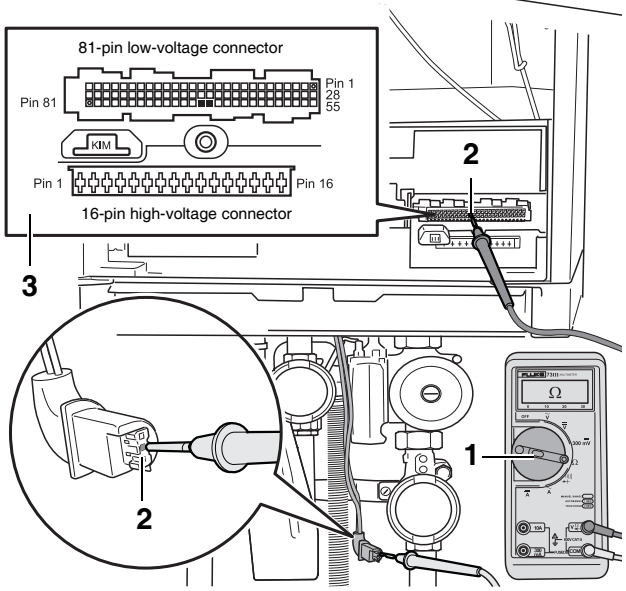
DANGER OF FATAL ACCIDENT
due to electric shock!

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door and remove the casing of the pump group as instructed in section 73.
- Remove the UBA 3 as instructed in section 82.
- Remove the cover from the connection tray, see section 114.



- Disconnect the pump tacho cable plug.



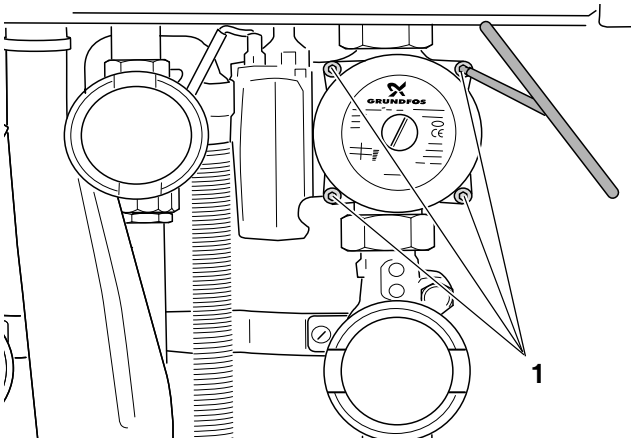


- Set the multimeter to "Measure resistance" [**1**].
- Connect the multimeter [**2**].
- Check the tacho cable of the pump for breaks.
  The electrical resistance measured separately for every wire must be approx. 0 Ω [**2**]. Measure between the plug and the black contacts (low-voltage connector pins 67 and 68) on the UBA 3 mounting base [**3**].
- Check the tacho cable of the pump for internal short circuiting. The electrical resistance, measured between two random wires, must be infinite. See section 131.
- Measure the electrical resistance over the pump tacho cable to ground. The electrical resistance must be infinite for every individual wire.
- Attach the pump tacho cable plug in reverse order of removal.
- Install the lid on the connection tray in reverse order.
- Install the UBA 3 in reverse order of removal.

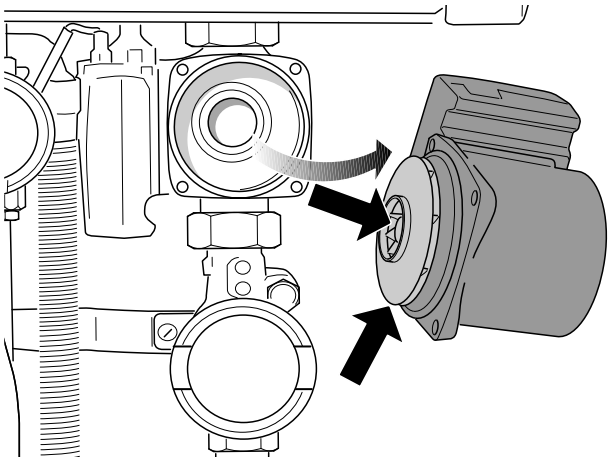
- Close the boiler door and install the casing of the pump group in reverse order of removal.
- Switch on the power supply to the heating system, see section 79.

section 91 Checking the pump; pollution

- Drain the boiler as indicated in section 75.



- Loosen the four Allen screws on the pump [**1**].
- Remove the upper part of the pump.

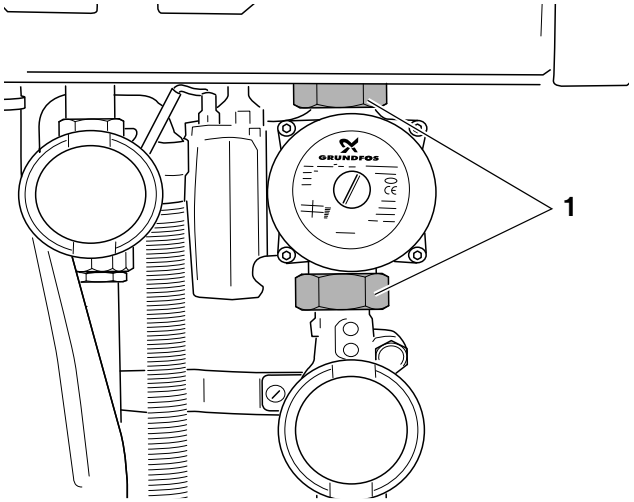


- Clean the pump impeller wheel by removing any deposits from the inner edges and / or the center of the pump impeller wheel.
- Install the upper part of the pump in reverse order.
- Fill and purge the heating system, see section 78.

section 92 Replacing the pump

DANGER OF FATAL ACCIDENT
due to electric shock!

- Drain the boiler as indicated in section 75.
- Undo the pump's power supply cord plug and the tacho cable plug as instructed insection 88 and 89.



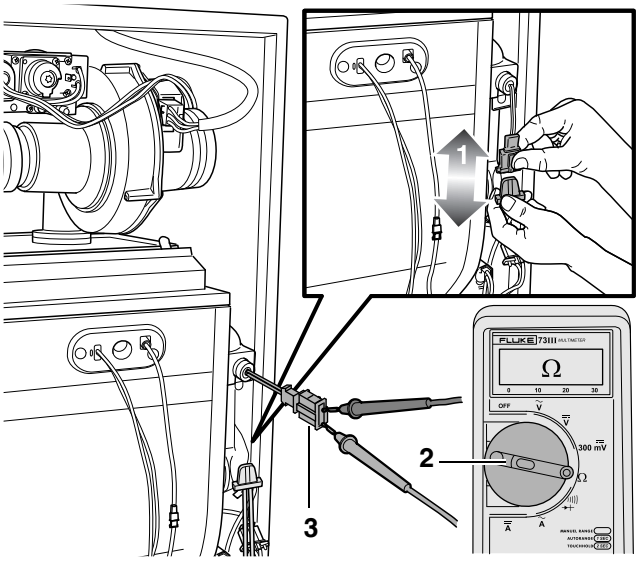
- Unscrew both unions [**1**] from the top and bottom of the pump.
- Remove the pump.

CAUTION!
Use new rubber seals when installing the new pump.

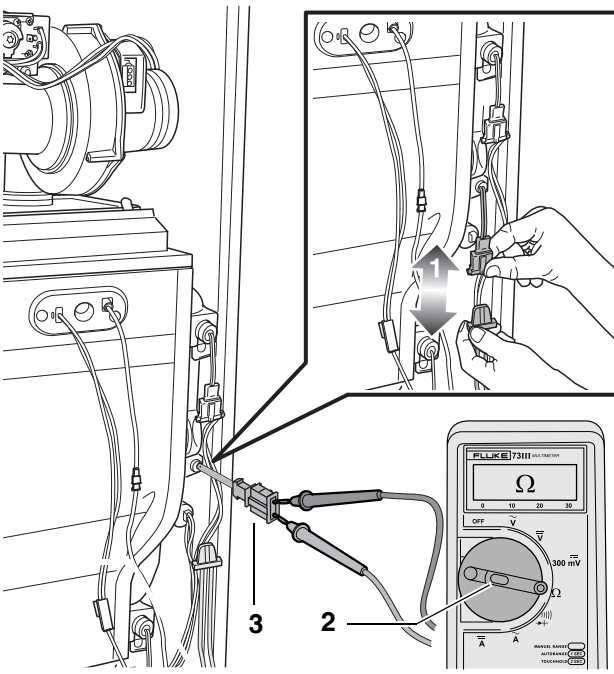
- Install the new pump.
- Attach the pump's power supply plug and tacho plug.
- Fill and purge the heating system, see section 78.

section 93 Checking the supply, safety, return and DHW temperature sensors

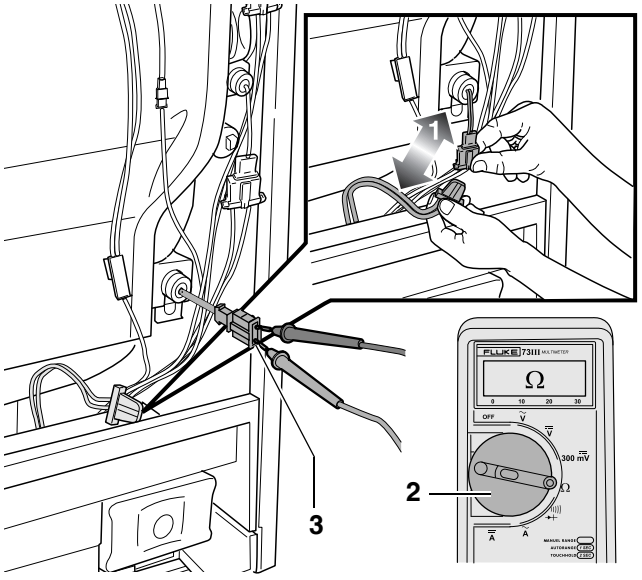
- Open a hot-water tap and wait for the boiler to start up, then gradually close the hot-water tap to bring the heating-system supply temperature to over 176 °F (80°C).
- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.



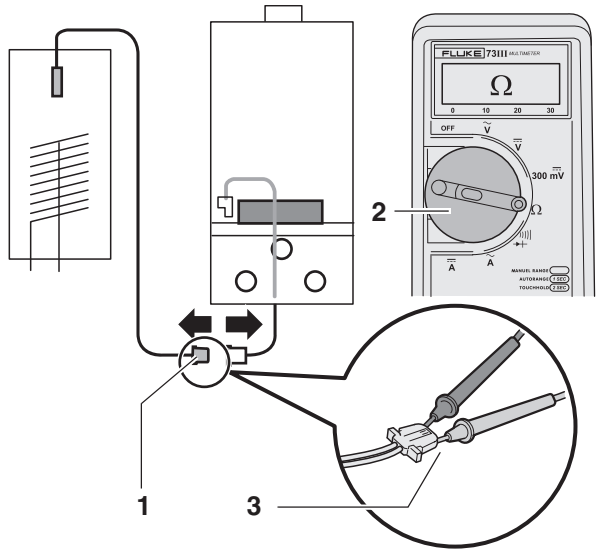
- Disconnect the supply temperature sensor plug [**1**]. This is the upper sensor.
- Set the multimeter to "Measure resistance" [**2**].
- Measure the electrical resistance of the supply temperature sensor [**3**].
- Measure the electrical resistance over the supply temperature sensor to ground. This electrical resistance must be infinite.



- Disconnect the safety temperature sensor plug [**1**]. This is the central sensor.
- Set the multimeter to "Measure resistance" [**2**].
- Measure the electrical resistance of the safety temperature sensor [**3**].
- Measure the electrical resistance over the safety temperature sensor to ground. This electrical resistance must be infinite.



- Disconnect the return temperature sensor plug [**1**]. This is the lower sensor.
- Set the multimeter to "Measure resistance" [**2**].
- Measure the electrical resistance of the return temperature sensor [**3**].
- Measure the electrical resistance over the return temperature sensor to ground. This electrical resistance must be infinite.



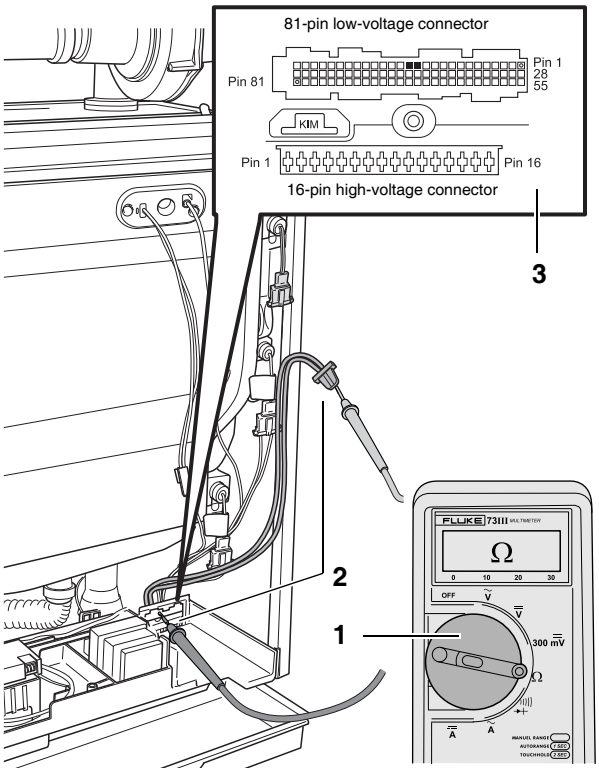
- Disconnect the DHW temperature sensor plug [**1**].
- Set the multimeter to "Measure resistance" [**2**].
- Measure the electrical resistance of the DHW temperature sensor [**3**].
- Measure the electrical resistance over the DHW temperature sensor to ground. This electrical resistance must be infinite.
- Use a digital contact-type thermometer to measure the temperature in the vicinity of the corresponding sensor.
- Compare the resistance values measured at the temperatures measured to the values in section 134.
- Replace the relevant sensor if the reading fluctuates by more than 10 % with respect to the reference value (e.g. infinitely high resistance in the event of a line break or resistance of 0 Ω in the case of a short circuit).
- Attach the relevant sensor plugs.
- Close the boiler door and install the casing of the pump group in reverse order of removal.
- Switch on the power supply to the heating system, see section 79.

section 94 Checking the supply, safety, return and DHW temperature sensors; cables

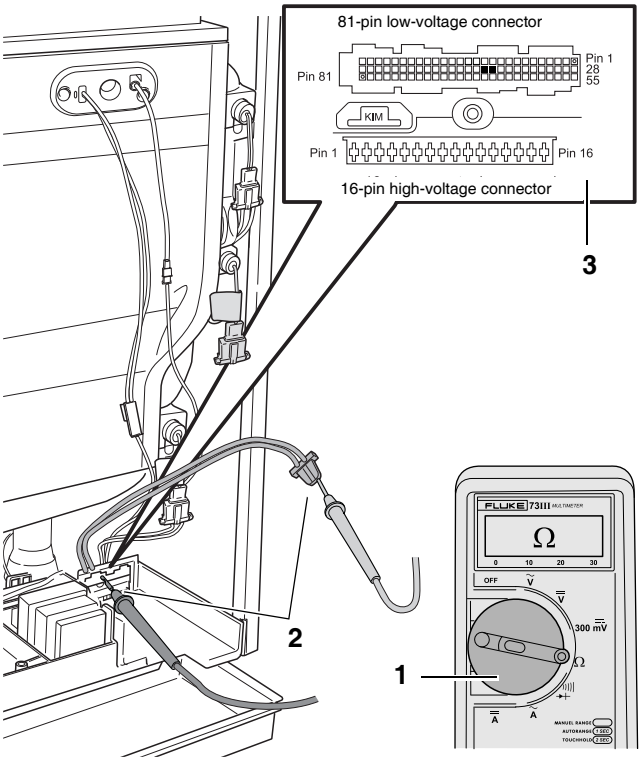
DANGER OF FATAL ACCIDENT
due to electric shock!

DAMAGE TO THE INSTALLATION!
To prevent damage, do not insert the multimeter measuring electrodes too far into the holes of the plug-and-socket connection.

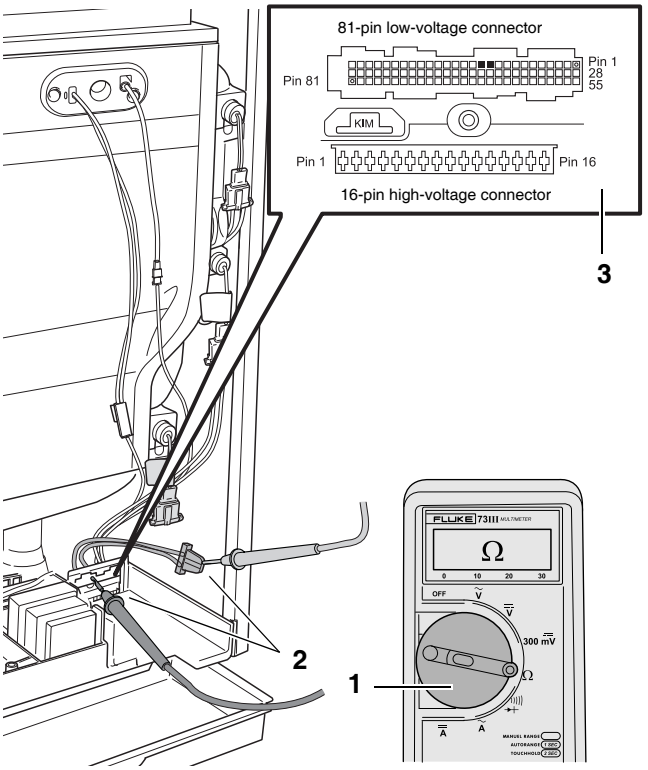
- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.
- Remove the UBA 3 as instructed in section 82.
- Remove the cover from the connection tray, see section 114.
- Disconnect the supply temperature sensor plug, see section 93, [**1**].



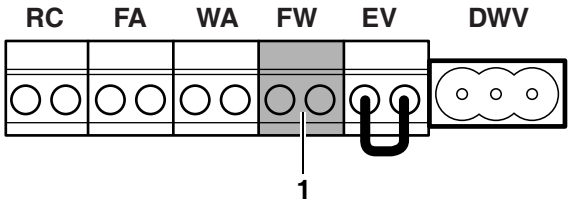
- Set the multimeter to "Measure resistance" [**1**].
- Check the supply temperature sensor cable for breaks. The electrical resistance measured separately for every wire must be approx. 0 Ω [**2**]. Measure between the plug and the black contacts (low-voltage connector pins 13 and 14) on the UBA 3 mounting base [**3**].
- Check the supply temperature sensor cable for internal short circuiting. The electrical resistance, measured between two random wires, must be infinite.
- Measure the electrical resistance over the supply temperature sensor cable to ground. The electrical resistance must be infinite for every individual wire.
- Disconnect the safety temperature sensor plug as instructed in section 93, [**1**].



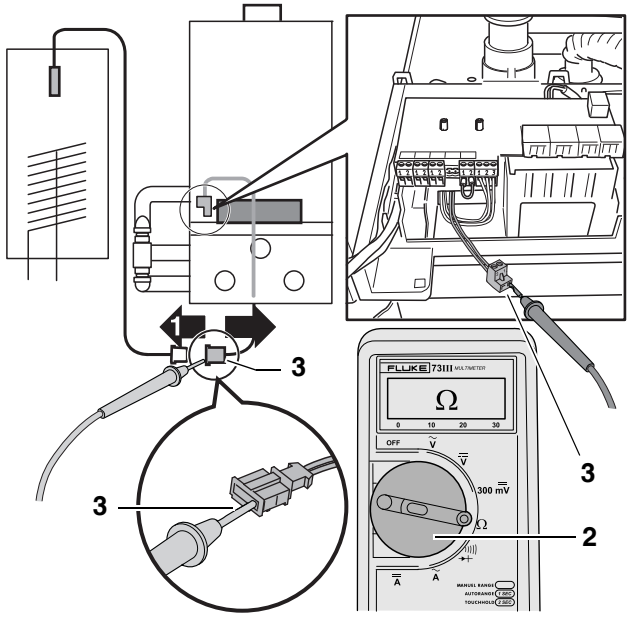
- Set the multimeter to "Measure resistance" [**1**].
- Check the safety temperature sensor cable for breaks. The electrical resistance measured separately for every wire must be approx. 0 Ω [**2**]. Measure between the plug and the black contacts (low-voltage connector pins 38 and 39) on the UBA 3 mounting base [**3**].
- Check the safety temperature sensor cable for internal short circuiting. The electrical resistance, measured between two random wires, must be infinite.
- Measure the electrical resistance over the safety temperature sensor cable to ground. The electrical resistance must be infinite for every individual wire.
- Disconnect the return temperature sensor plug as instructed in section 93, [**1**].



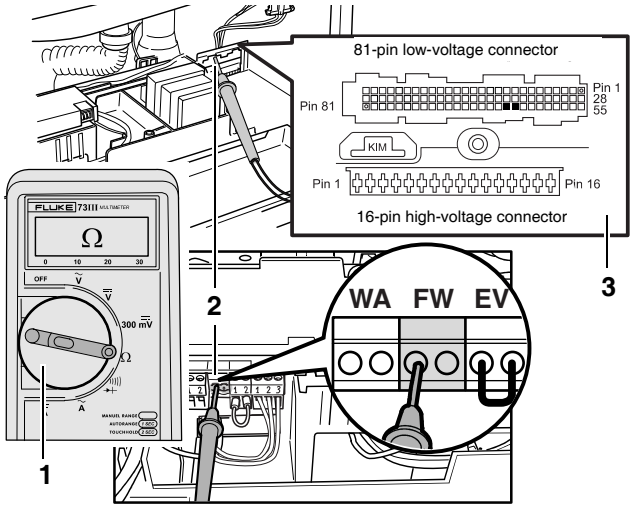
- Set the multimeter to "Measure resistance" [**1**].
- Check the return temperature sensor cable for breaks. The electrical resistance measured separately for every wire must be approx. 0 Ω [**2**]. Measure between the plug and the black contacts (low-voltage connector pins 11 and 12) on the UBA 3 mounting base [**3**].
- Check the return temperature sensor cable for internal short circuiting. The electrical resistance, measured between two random wires, must be infinite.
- Measure the electrical resistance over the return temperature sensor cable to ground. The electrical resistance must be infinite for every individual wire.



- Disconnect the DHW temperature sensor (FW) plug in the connection tray [**1**].



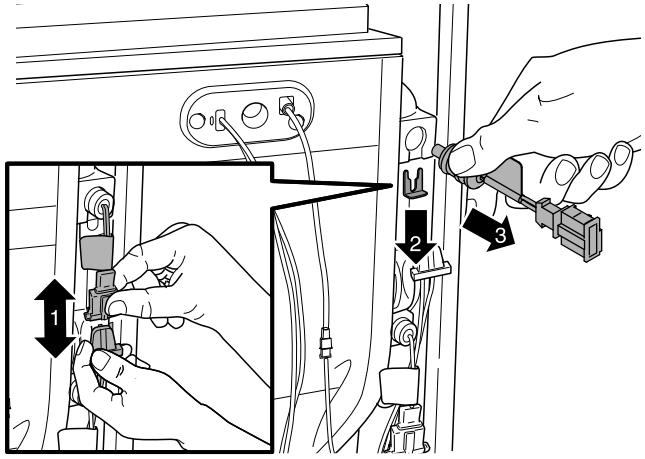
- Disconnect the DHW temperature sensor plug [**1**].
- Set the multimeter to "Measure resistance" [**2**].
- Check the DHW temperature sensor cable for breaks. The electrical resistance measured separately for every wire must be approx. 0 Ω [**3**].
- Check the DHW temperature sensor cable for internal short circuiting. The electrical resistance, measured between two random wires, must be infinite.
- Measure the electrical resistance over the DHW temperature sensor cable to ground. The electrical resistance must be infinite for every individual wire.



- Set the multimeter to "Measure resistance" [**1**].
- Check the cable of the DHW temperature sensor between the connection tray and the UBA 3 mounting base for breaks. The electrical resistance measured separately for every wire must be approx. 0 Ω [**2**]. Measure between the connection tray and the black contacts (low-voltage connector pins 63 and 64) on the UBA 3 mounting base [**3**].
- Check the cable of the DHW temperature sensor between the connection tray and the UBA 3 mounting base for internal short circuiting. The electrical resistance, measured between two random wires, must be infinite.
- Measure the electrical resistance over the DHW temperature sensor cable to ground. The electrical resistance must be infinite for every individual wire.
- Attach the relevant sensor plugs.
- Install the UBA 3 in reverse order of removal.
- Install the lid on the connection tray in reverse order.
- Close the boiler door in reverse order.
- Switch on the power supply to the heating system, see section 79.

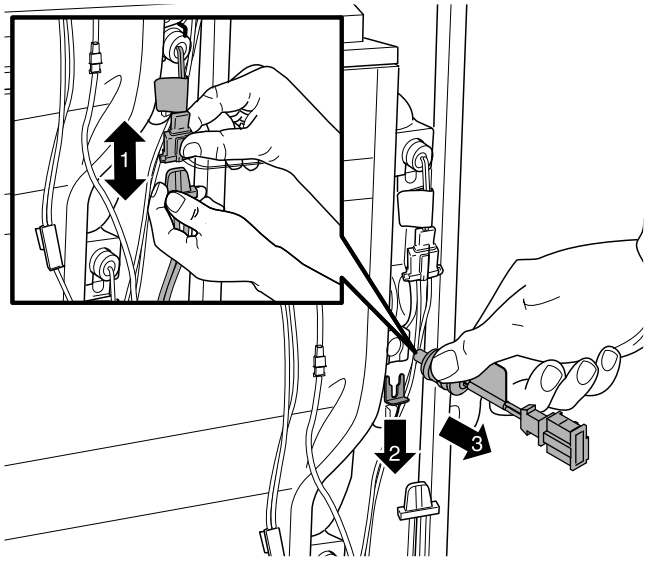
section 95 Replacing the feed, safety and return sensors

- Drain the boiler, see section 75.
- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.



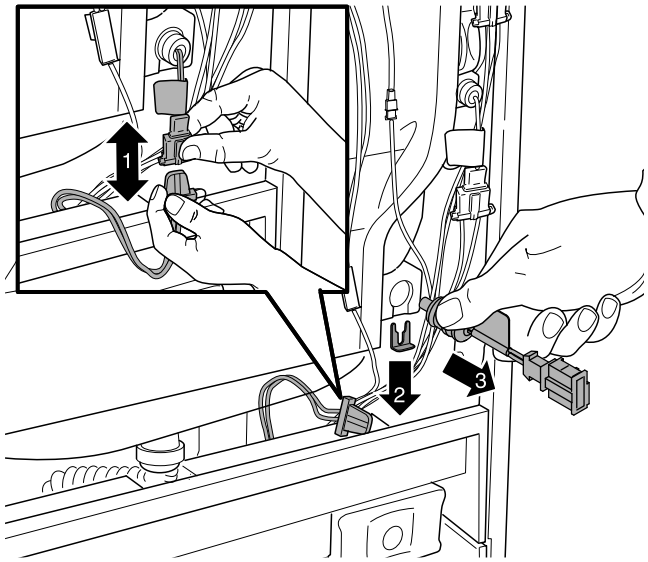
CAUTION!
Note that some water may escape when the sensor is removed. Keep a bucket and a cleaning rag ready.

- Disconnect the supply temperature sensor plug [**1**].
- Remove the clamp spring of the supply temperature sensor by moving it in the direction indicated by the arrow [**2**].
- Remove the supply temperature sensor [**3**].



CAUTION!
Note that some water may escape when the sensor is removed. Keep a bucket and a cleaning rag ready.

- Disconnect the safety temperature sensor plug [**1**].
- Remove the clamp spring of the safety temperature sensor by moving it in the direction indicated by the arrow [**2**].
- Remove the safety temperature sensor [**3**].

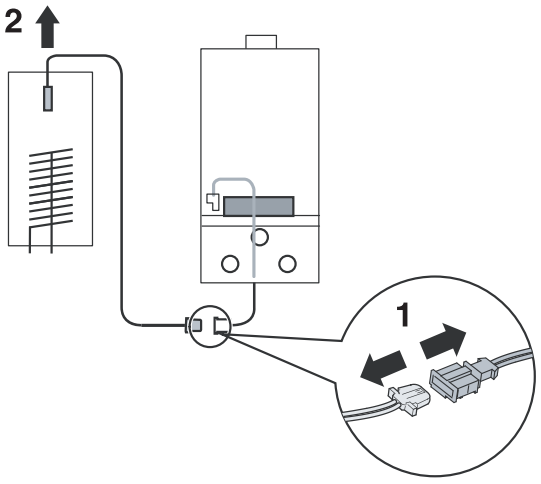


CAUTION!
Note that some water may escape when the sensor is removed. Keep a bucket and a cleaning rag ready.

- Disconnect the return temperature sensor plug [**1**].
- Remove the clamp spring [**2**].
- Remove the return temperature sensor [**3**].
- Install the relevant new sensor in reverse order.
- Fill and purge the heating system and put the boiler into operation, see section 78.
- Switch on the power supply to the heating system, see section 79.

section 96 Replacing the DHW temperature sensor

- Switch off the power supply to the heating system, see section 72.

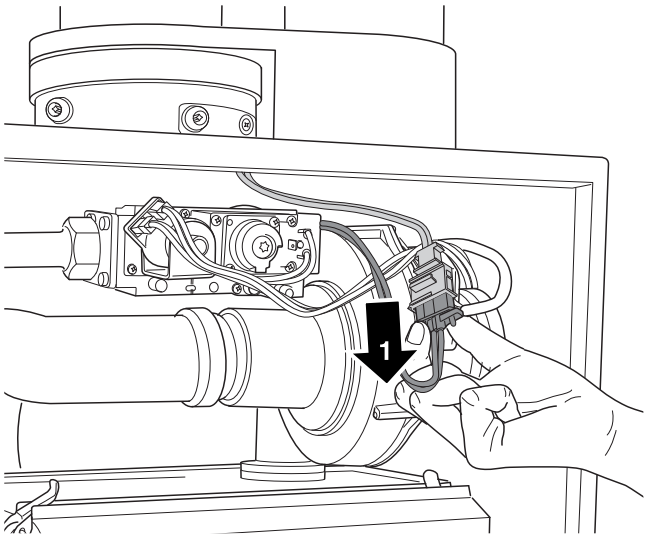


- Disconnect the DHW temperature sensor plug [**1**].
- Remove the DHW temperature sensor from the tank [**2**].
- Install the new DHW temperature sensor in reverse order.
- Attach the plug of the DHW temperature sensor in reverse order.
- Switch on the power supply to the heating system, see section 79.

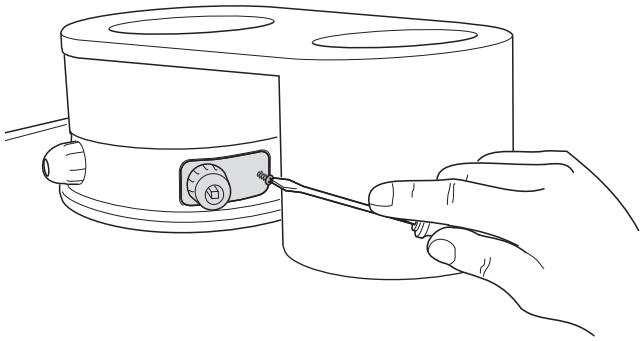
section 97 Checking the flue gas sensor

DANGER OF FATAL ACCIDENT/FIRE
due to flue gas escaping. After carrying out these activities, check the system for leaks on the flue gas side.

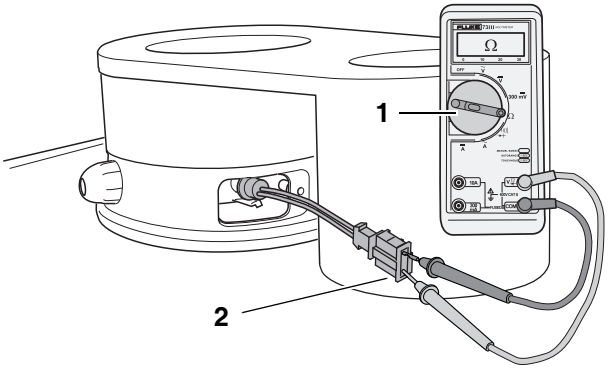
- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.



- Disconnect the plug of the flue gas sensor [**1**].



- Remove the cap from the measuring nipple of the combustion air supply.

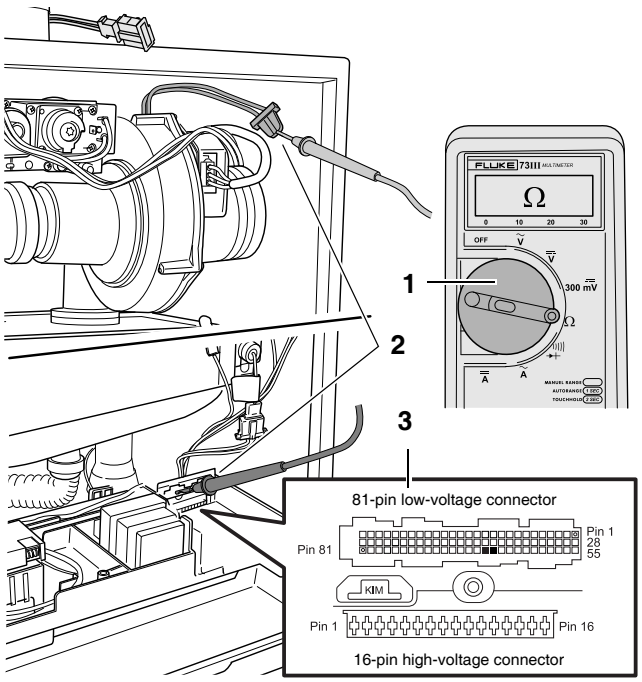


- Pull the plug of the flue gas sensor upwards.
- Set the multimeter to "Measure resistance" [**1**].
- Check the electrical resistance of the flue gas sensor by measuring it [**2**].
- Check the flue gas temperatures by measuring them in the flue gas measuring nipple, see section 1, [**16**].
- Compare the resistance values measured and flue gas temperatures measured, to the values in section 134.
- Replace the flue gas sensor if the reading fluctuates by more than 10 % with respect to the reference value (e.g. infinitely high resistance in the event of a line break or resistance of 0 Ω in the case of a short circuit).
- Attach the plug of the flue gas sensor in reverse order.
- Install the cap on the measuring nipple of the combustion air supply.
- Close the boiler door in reverse order.
- Switch on the power supply to the heating system, see section 79.

section 98 Checking the flue gas sensor; cable

DANGER OF FATAL ACCIDENT
due to electric shock!

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.
- Remove the UBA 3 as instructed in section 82.
- Remove the cover from the connection tray, see section 114.
- Disconnect the plug of the flue gas sensor as instructed in section 97.



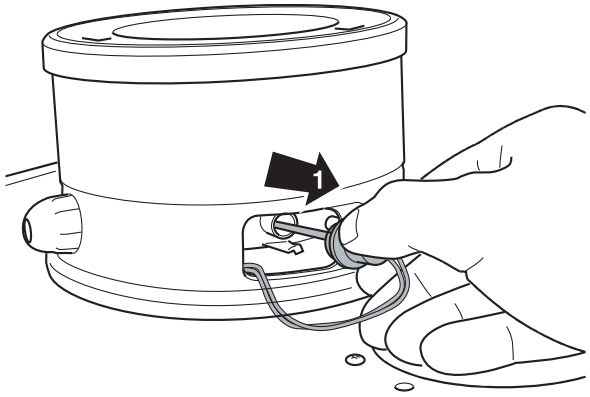
- Set the multimeter to "Measure resistance" [**1**].
- Check the safety sensor cable for breaks. The electrical resistance measured separately for every wire must be approx. 0 Ω [**2**]. Measure between the plug and the black contacts (low-voltage connector pins 65 and 66) on the UBA 3 mounting base [**3**].
- Check the flue gas sensor cable for internal short circuiting. The electrical resistance, measured between two random wires, must be infinite.
- Measure the electrical resistance over the flue gas sensor cable to ground. The electrical resistance must be infinite for every individual wire.
- Attach the plug of the flue gas sensor in reverse order.
- Install the lid on the connection tray in reverse order.
- Install the UBA 3 in reverse order of removal.
- Close the boiler door as instructed in section 73.
- Switch on the power supply to the heating system, see section 79.

section 99 Replacing the flue gas sensor

DANGER OF FATAL ACCIDENT/FIRE
due to flue gas escaping.

- After carrying out these activities, check the system for leaks on the flue gas side.

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.
- Disconnect the plug of the flue gas sensor as instructed in section 97.
- Remove the cap from the measuring nipple of the combustion air supply as instructed in section 97.

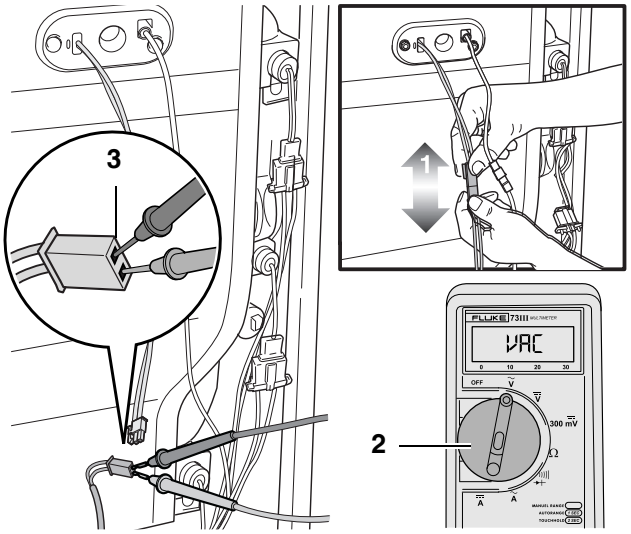


- Remove the flue gas sensor [**1**].
- Install the new flue gas sensor in reverse order.
- Attach the plug of the new flue gas sensor in reverse order.
- Close the boiler door in reverse order.
- Switch on the power supply to the heating system, see section 79.

section 100 Checking the glow ignitor; activation

DANGER OF FATAL ACCIDENT
due to electric shock!

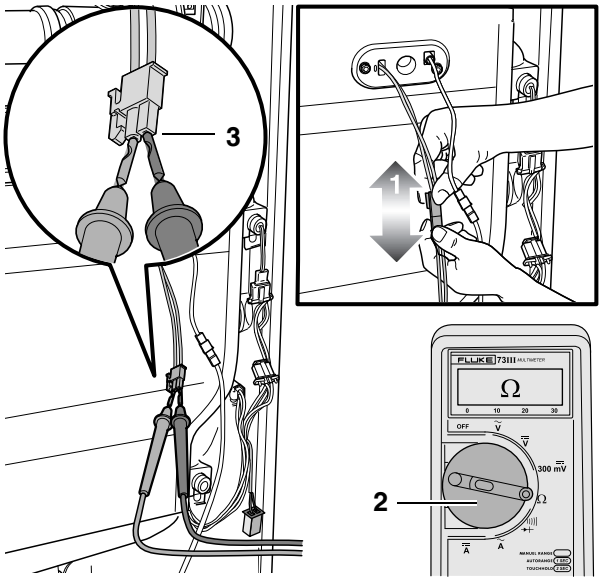
- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.



- Disconnect the plug of the glow ignitor [**1**].
- Set the multimeter to "Measure AC voltage". Minimum measuring range: 120 VAC [**2**].
- Switch on the power supply to the heating system, see section 79.
- Put the boiler in flue gas test mode, see section 20.
- Check that approx. 120 VAC is measured on the plug [**3**] while the operating code 0C is displayed.
- Switch off the power supply to the heating system, see section 72.
- Attach the plug of the glow ignitor in reverse order.
- Close the boiler door in reverse order.
- Switch on the power supply to the heating system, see section 79.

section 101 Checking the glow ignitor; resistance

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.



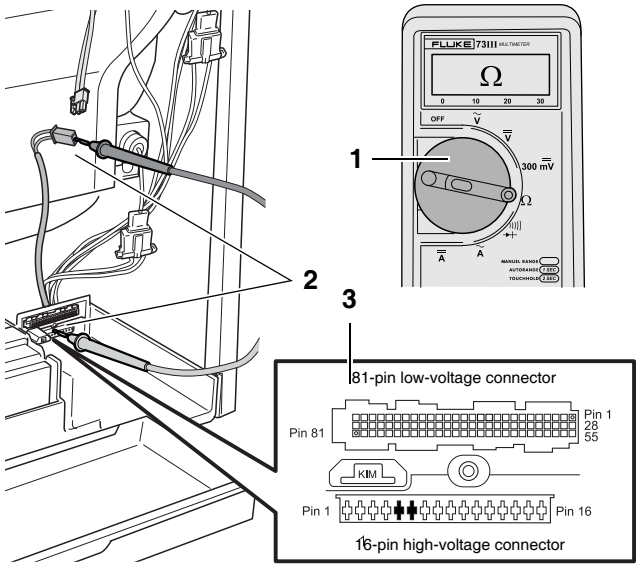
- Disconnect the plug of the glow ignitor [**1**].
- Set the multimeter to "Measure resistance" [**2**].
- Check that the electrical resistance of the glow ignitor is between 50 and 300 Ω [**3**].
- Attach the plug of the glow ignitor in reverse order.
- Close the boiler door in reverse order.
- Switch on the power supply to the heating system, see section 79.

section 102 Checking the glow ignitor; power supply cord

DANGER OF FATAL ACCIDENT
due to electric shock!

DAMAGE TO THE INSTALLATION!
To prevent damage, do not insert the multimeter measuring electrodes too far into the holes of the plug-and-socket connection.

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.
- Remove the UBA 3 as instructed in section 82.
- Remove the cover from the connection tray, see section 114.
- Disconnect the plug of the glow ignitor as instructed in section 101, [**1**].



- Set the multimeter to "Measure resistance" [**1**].
- Check the power supply cord of the glow ignitor for breaks. The electrical resistance measured separately for every wire must be approx. 0 Ω [**2**]. Measure between the plug and the black contacts (low-voltage connector pins 5 and 6) on the UBA 3 mounting base [**3**].
- Check the power supply cord of the glow ignitor for internal short circuiting. The electrical resistance, measured between two random wires, must be infinite.
- Measure the electrical resistance over the glow ignitor cable to ground. The electrical resistance must be infinite for every individual wire.
- Attach the plug of the glow ignitor in reverse order.
- Install the lid on the connection tray in reverse order.
- Install the UBA 3 in reverse order of removal.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 103 Replacing the ignition unit

DANGER OF FATAL ACCIDENT
due to electric shock!

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.
- Disconnect the plug of the glow ignitor as instructed in section 101, [**1**] and or the plug of the ionization electrode as instructed in section 104, [**1**].

Type A (old version)

- Loosen both nuts [**1**].
- Remove the retaining plate [**2**].
- Remove the complete ignition unit: glow ignitor, ionization electrode, sight glass with rubber seal, ignition unit housing and bolts.

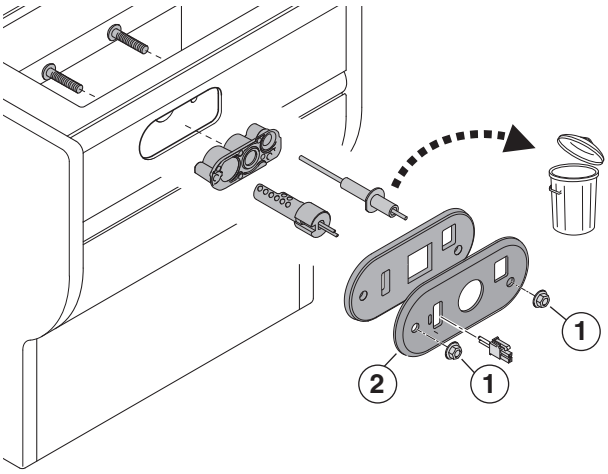


fig. 5 Old version ignition unit

Type B (new version)

- Remove the complete ignition unit: ignition unit housing [**1**], glow ignitor [**2**], ionization electrode [**3**], seal [**4**], rubber seal with sight glass [**5**], bolts [**6**] and nuts [**7**].

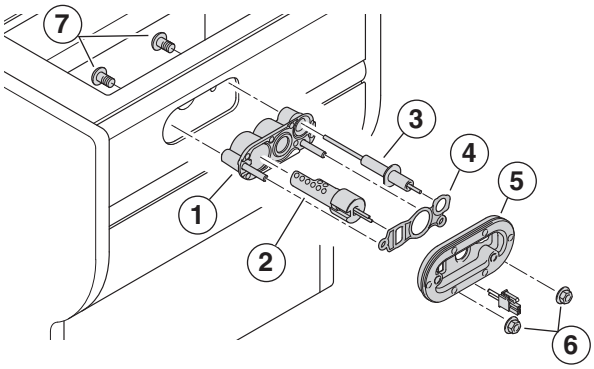


fig. 6 New version ignition unit

DANGER OF FATAL ACCIDENT/FIRE
due to flue gas escaping or explosion of flamable gases.

All work on gas pipe work and fittings must be carried out by authorized gas technicians.

DAMAGE TO THE INSTALLATION
due to incorrect glow ignitor assembly.

- The glow ignitor is highly breakable. Handle with care.
- Install the glow ignitor so that the lug of the heat exchanger is located in the relevant opening in the glow ignitor.

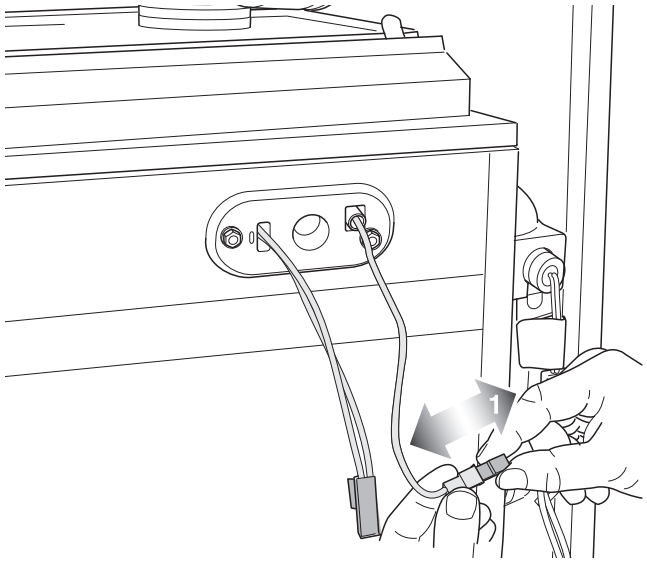
DAMAGE TO THE INSTALLATION
due to incorrect assembly.

- Check that both bolts of the rubber seal with sight glass are tightened evenly.

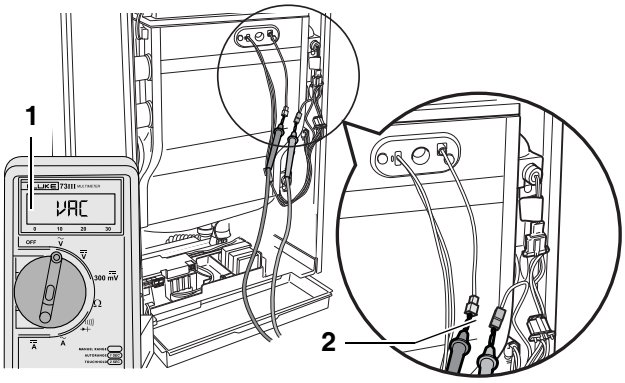
- Install all new parts of tthe ignition unit (ignition unit housing [**1**], glow ignitor [**2**], ionization electrode [**3**], seal [**4**], rubber seal with sight glass [**5**], bolts [**6**] and nuts [**7**]).
- Attach the plug of the glow ignitor and the ionization electrode in reverse order.
- Open the gas stop valve and put the boiler into chimney sweep operation as instructed in section 81.
- Check all couplings and locations in the gas train, which have been disconnected, for leaks. Use a foaming agent which has been approved for gas leak testing.
- If a gas leak is found: switch off the power supply to the heating system, see section 72, close the gas stop valve as indicated in section 74 and deal with the cause of the gas leak.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 104 Measure the ionization current

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.



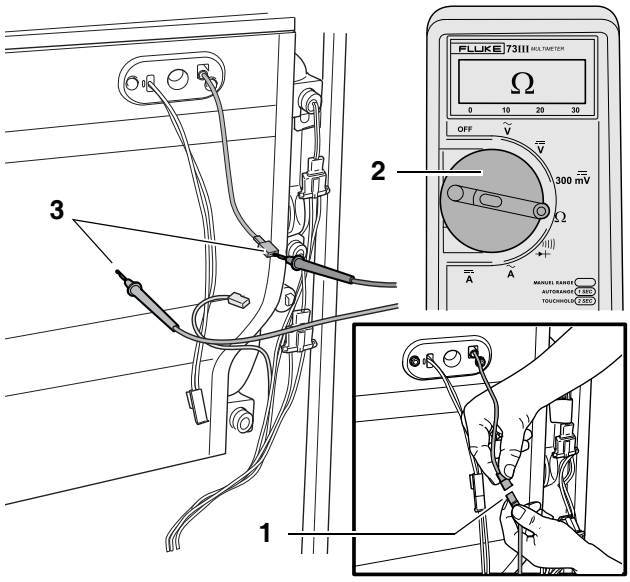
- Disconnect the plug of the ionization electrode [**1**].



- Select the µA DC range on the multimeter. The multimeter must have a resolution of at least 1µA [**1**].
- Connect the multimeter to the ionization circuit in series [**2**].
- Switch on the power supply to the heating system, see section 79.
- Put the boiler in service mode, see section 21.
- During service mode, adjust the capacity to [L25] = 25 % with an 80-kW boiler or [L20] = 20 % with a 100-kW boiler.
- Check that the ionization current is at least 3 µA (microamperes) during service mode, operating code [-A-].
  The actual value in practice is 5 - 40 µA.
- Switch off the power supply to the heating system, see section 72.
- Remove the multimeter.
- Connect the plug of the ionization electrode.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 105 Checking the ionization electrode; short circuit

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.



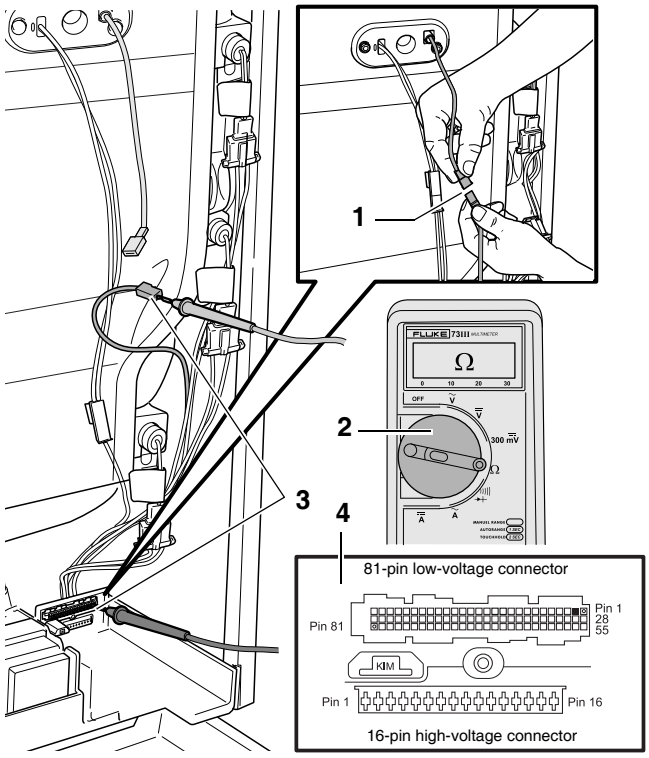
- Disconnect the plug and socket connection of the ionization electrode [**1**].
- Set the multimeter to "Measure resistance" [**2**].
- Measure the ionization electrode to ground to make sure that there is no short circuit between the ionization electrode and ground. The electrical resistance between the ionization electrode and ground must be infinite [**3**].
- Attach the plug of the ionization electrode in reverse order.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 106 Checking the ionization electrode; cable

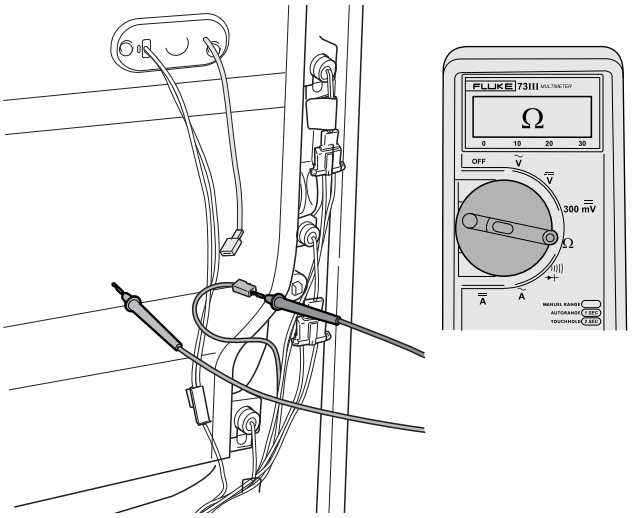
DANGER OF FATAL ACCIDENT
due to electric shock!

DAMAGE TO THE INSTALLATION!
To prevent damage, do not insert the multimeter measuring electrodes too far into the holes of the plug-and-socket connection.

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.
- Remove the UBA 3 as instructed in section 82.
- Remove the cover from the connection tray, see section 114.



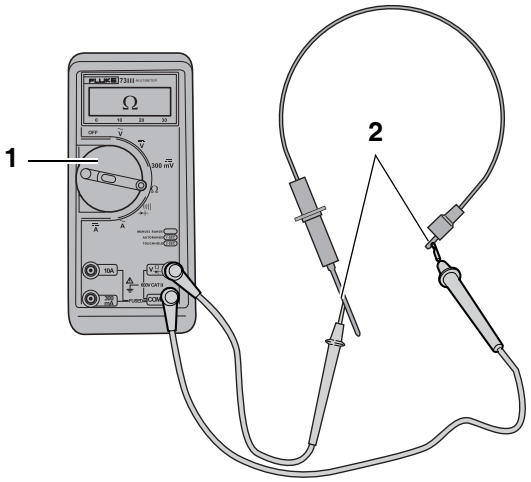
- Disconnect the plug of the ionization electrode [**1**].
- Set the multimeter to "Measure resistance" [**2**].
- Carry out a measurement to make sure that there is no breakage in the ionization electrode cable. The electrical resistance measured separately for every wire must be approx. 0 Ω [**3**]. Measure between the plug and the black contact (low-voltage connector pin 2) on the UBA 3 mounting base [**4**].



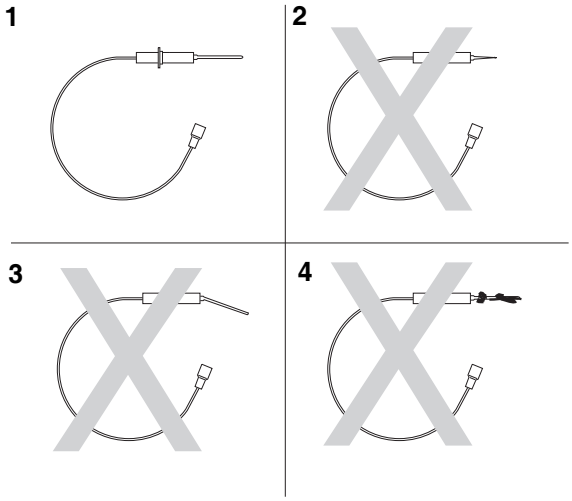
- Carry out a measurement to make sure that there is no short circuit between the ionization electrode cable and ground. The electrical resistance between the ionization electrode cable and ground must be infinite.
- Connect the plug of the ionization electrode.
- Install the lid on the connection tray in reverse order.
- Install the UBA 3 in reverse order of removal.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 107 Checking the ionization electrode

- Disassemble the ionization electrode as indicated in section 103.



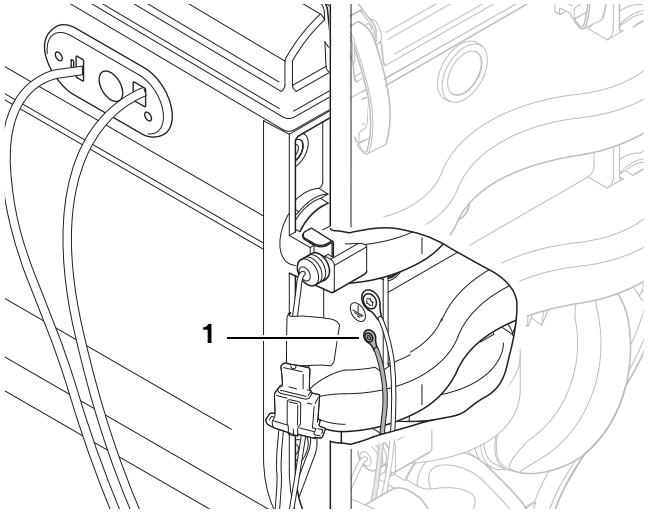
- Set the multimeter to "Measure resistance" [**1**].
- Carry out a measurement to make sure that there is no breakage in the ionization electrode. The electrical resistance of the ionization electrode cable must be approximately 0 Ω [**2**].



- Check the ionization electrode for signs of wear [**2**], damage [**3**] or contamination [**4**].
- Replace the ionization electrode if necessary.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 108 Checking the ionization circuit; ground lead

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.



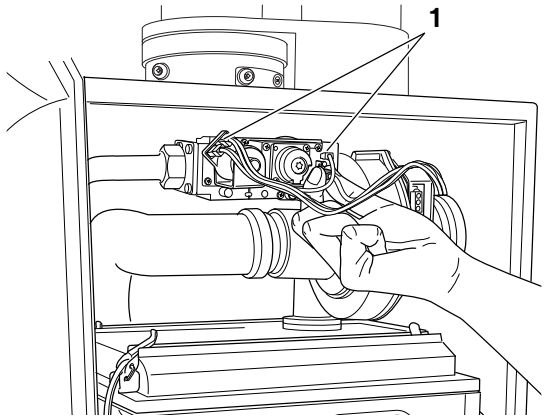
- Check that the ground lead of the ionization circuit [**1**] has been installed correctly.

Note: The upper cable is the ground lead of the heat exchanger pump, the lower cable [**1**] is the ground lead of the ionization circuit.

- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 109 Checking the gas valve; power supply plug

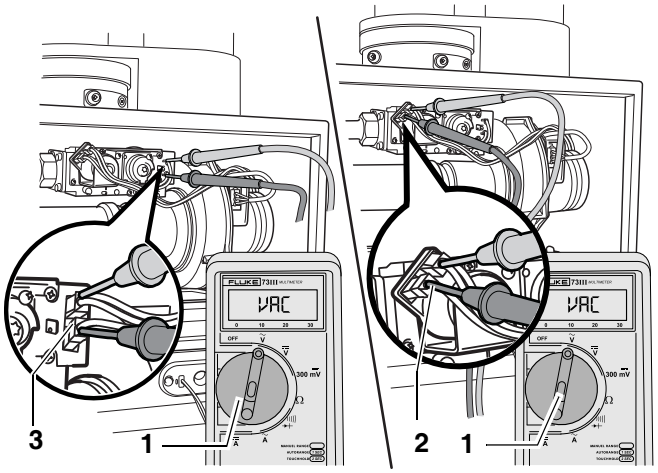
- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.



- Check that the power supply plug [**1**] has been attached correctly to the gas valve.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 110 Checking the gas valve; activation

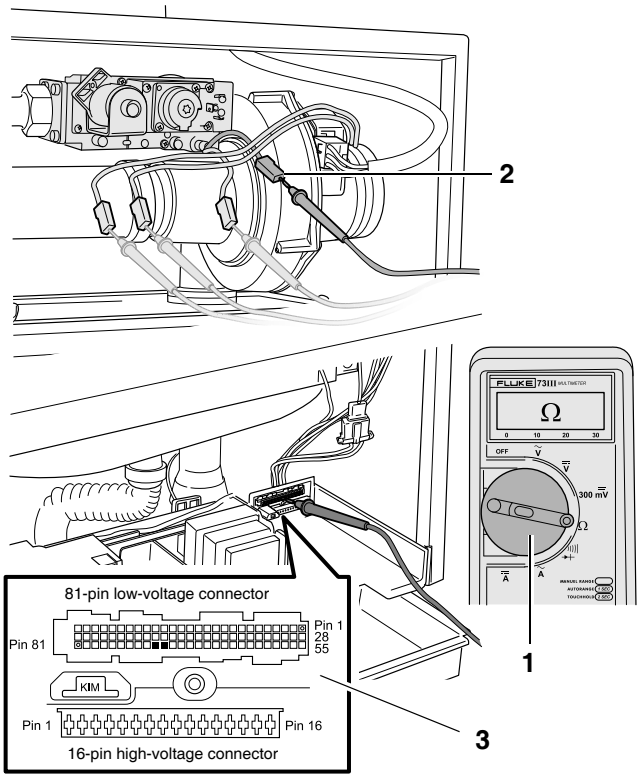
- Open the boiler door as instructed in section 73.



- Set the multimeter to "Measure AC voltage" [**1**]. Minimum measuring range 40 VAC.
- Put the boiler in flue gas test mode, see section 20.
- Check that the gas valve is activated: While operating code 01 is displayed, approx. 24 VAC must be available on the two contacts of the right-hand coil [**2**] and on the two contacts of the left-hand coil [**3**] of the gas valve power supply plug.
- Stop the flue gas test as instructed in section 20.
- Close the boiler door as instructed in section 77.

section 111 Checking the gas valve; electrical resistance of the power supply cord

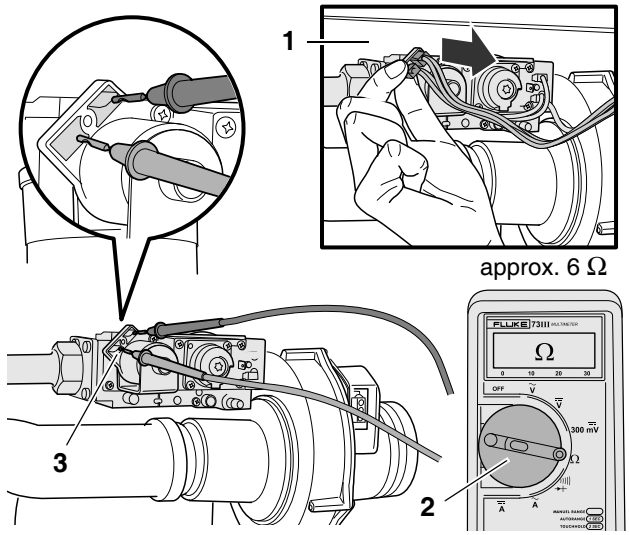
- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.
- Remove the UBA 3 as instructed in section 82.
- Remove the cover from the connection tray, see section 114.
- Undo the plug or plugs of the gas valve supply cord as shown in the illustration in section 109.



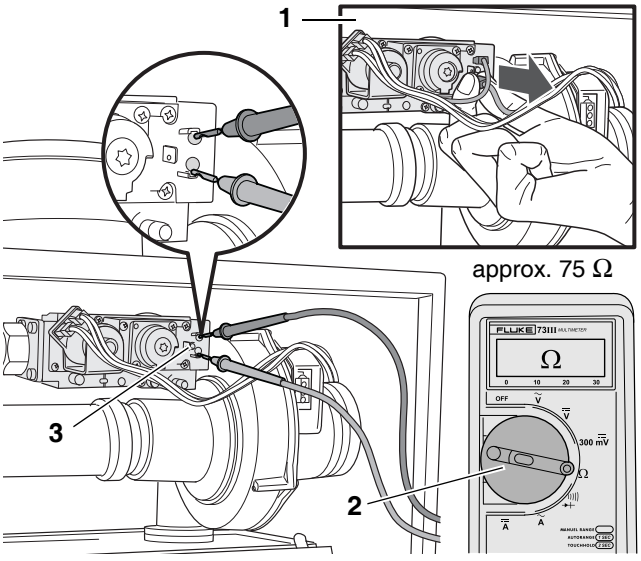
- Set the multimeter to "Measure resistance" [**1**].
- Check the power supply cord of the gas valve for breaks.
- The electrical resistance measured separately for every wire must be approx. 0 Ω [**2**]. Measure between the plug and the black contacts (low-voltage connector pins 71 and 72) on the UBA 3 mounting base [**3**].
- Check the power supply cord of the gas valve for internal short circuiting. The electrical resistance, measured between two random wires, must be infinite.
- Carry out a measurement to ground to make sure that there is no short circuit between the gas valve and ground. The electrical resistance between the gas valve cable and ground must be infinite. See section 131.
- Attach the gas valve plug or plugs in reverse order of removal.
- Install the lid on the connection tray in reverse order.
- Install the UBA 3 in reverse order of removal.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 112 Checking the gas valve; internal electrical resistance

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.



- Disconnect the plug of the gas valve [**1**].
- Set the multimeter to "Measure resistance" [**2**].
- Check the internal electrical resistance of the left-hand coil of the gas valve by measuring it. The electrical resistance of the left-hand coil must be approximately 6 Ω [**3**].



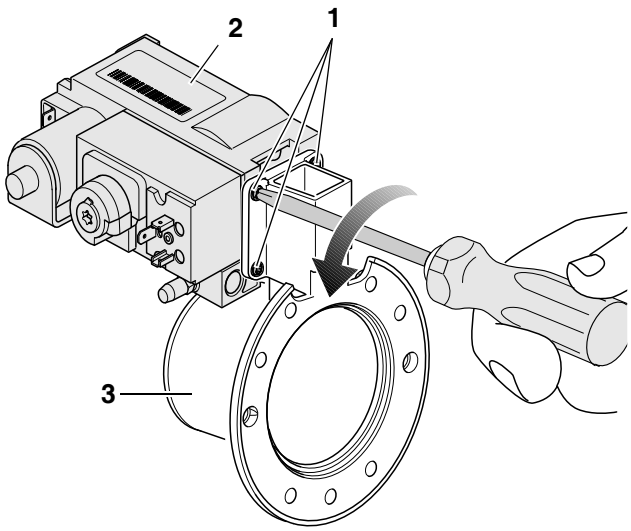
- Disconnect the plug of the gas valve [**1**].
- Set the multimeter to "Measure resistance" [**2**].
- Check the internal electrical resistance of the right-hand coil of the gas valve by measuring it. The electrical resistance of the right-hand coil must be approximately 75 Ω [**3**].
- Attach the gas valve plug or plugs in reverse order of removal.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 113 Replacing the gas valve

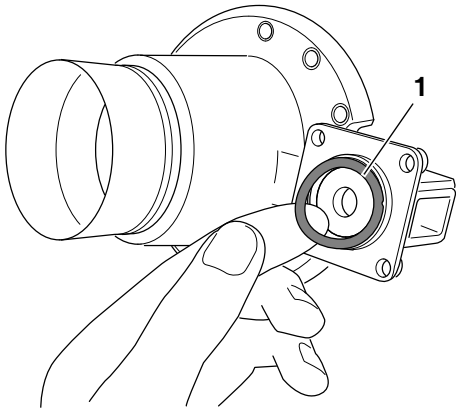
DANGER OF FATAL ACCIDENT/FIRE
from explosive fumes.
All work on gas pipe work and fittings must be carried out by authorized gas technicians.

- While carrying out these activities check all sealing rings and gaskets for damage, deformation and signs of ageing and replace if required.
- After carrying out these activities, check the system for leaks on the gas side and/or the flue gas side.
- After carrying out these activities check the measuring nipples used for leaks using a foaming agent which has been approved for gas leak testing.

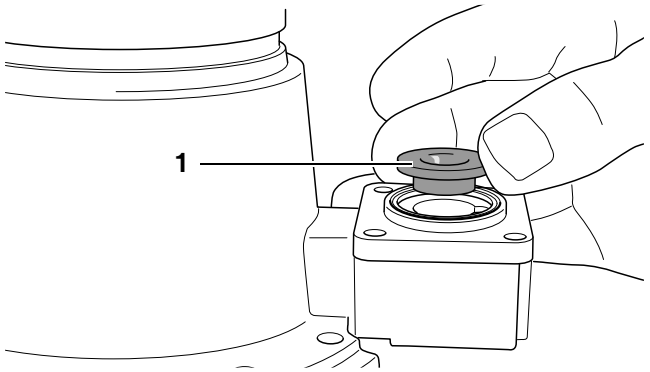
- Switch off the power supply to the heating system, see section 72.
- Open the boiler door and remove the casing of the pump group as instructed in section 73.
- Close the gas stop valve as indicated in section 74.
- Disassemble the gas valve as indicated in section 86.



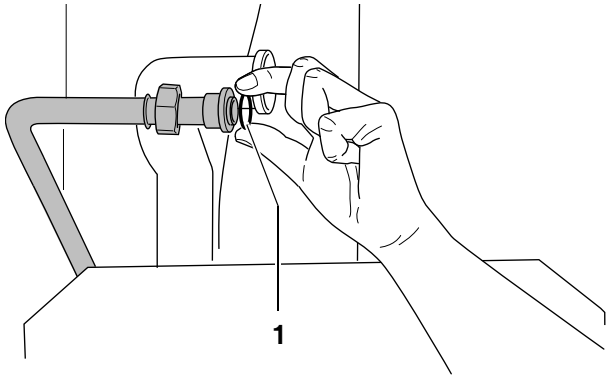
- **100 kW**: Loosen the 4 torx screws [**1**] and remove the gas valve [**2**] from the venturi pipe [**3**].



- Install a new O-ring [**1**] in the venturi pipe.



- Install the orifice [**1**] in the venturi pipe.
- Install the new gas valve on the venturi pipe in reverse order, as instructed before.
- If necessary, replace the gasket between the fan unit and the venturi pipe as instructed in section 86.
- Install the new gas valve including the venturi pipe on the fan unit in reverse order, as instructed before.



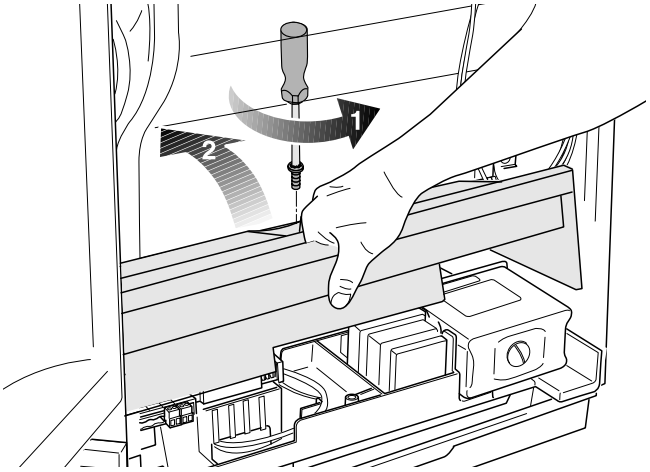
- Check the rubber seal [**1**] for signs of ageing and damage and replace it if necessary.
- Install the gas/air unit including the burner cover in reverse order of removal as instructed in section 86.
- Install the air suction pipe on the venturi pipe in reverse order, as instructed in section 86.
- Connect the plug of the fan unit power supply cord and the plug of the fan unit tacho cable in reverse order as instructed in section 86.
- Attach the gas valve plug or plugs in reverse order of removal as instructed in section 86.

CAUTION!
While connecting the gas pipe to the gas valve make sure that the rubber seal is fitted between the gas pipe and the gas valve.

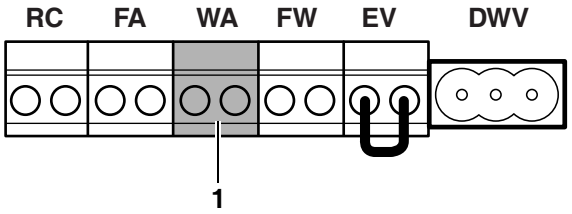
- Connect the gas pipe to the gas valve in reverse order as instructed in section 86.
- Open the gas stop valve as indicated in section 81.
- Switch on the power supply to the heating system, see section 79.
- Check the gas/air ratio and adjust it if necesaary, see section 119.
- Close the boiler door as instructed in section 91.

section 114 Checking the ON/OFF controller

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.



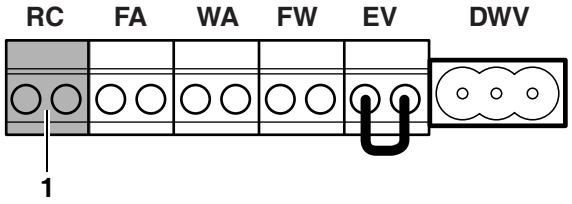
- Loosen the screw [**1**].
- Remove the cover from the connection tray [**2**].
- Remove the ON/OFF controller from the wall.



- Connect the ON/OFF controller to the green plug ("WA", [**1**]) in the connection tray of the boiler, using a short length of two-pole electric cable.
- Switch on the power supply to the heating system, see section 79.
- Adjust the selector for the DHW temperature setting on the control panel to position "0", see section 70, [**1**].
- Set the ON/OFF controller to heat demand operation. If the boiler runs in heating mode [-H] for approx. 3 minutes, the cause of the fault lies outside the heating boiler.
- Switch off the power supply to the heating system, see section 72.
- Attach the ON/OFF controller to the wall in reverse order of removal.
- Connect the ON/OFF controller to the boiler in reverse order.
- Install the lid on the connection tray in reverse order.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.
- Adjust the selector for the DHW temperature setting on the control panel to the required position, as instructed in section 81, [**1**].

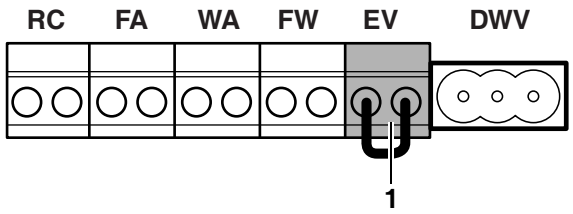
section 115 Checking the RC regulator

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.
- Remove the cover from the connection tray, see section 114.
- Remove the RC regulator from the mounting plate.
- Remove the mounting plate from the wall.



- Use a short length of two-pole electric cable to connect the RC regulator including the mounting plate to the orange plug directly at the boiler ("RC", [**1**]). When using an RC regulator which must be connected with an RCC, connect the RC regulator to the RCC using a short length of two-pole electric cable.
- When using an RCC: Check that the RCC has been connected correctly to the boiler connection tray.
- Check that the contacts 1 and 2 on the back of the RCC correspond with contacts 1 and 2 of the orange plug ("RC", [**1**]).
- Switch on the power supply to the heating system, see section 79.
- Adjust the selector for the DHW temperature setting on the control panel to position "0", see section 70, [**1**].
- Set the RC regulator to heat demand operation. If the boiler runs in heating mode [-H] for approx. 3 minutes, the cause of the fault lies outside the heating boiler.
- Switch off the power supply to the heating system, see section 72.
- Attach the RC regulator to the wall in reverse order of removal.
- Connect the RC regulator to the boiler in reverse order.
- Install the lid on the connection tray in reverse order.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.
- Adjust the selector for the DHW temperature setting on the control panel to the required position, as instructed in section 81, [**1**].

section 116 Checking an external switch contact



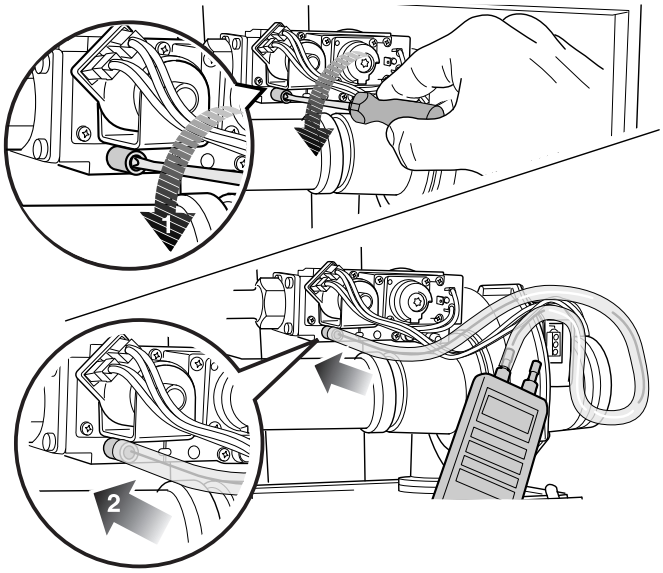
- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.
- Remove the cover from the connection tray, see section 114.
- Check that an external switch contact has been connected at [**1**].
- Check that a connection loop has been connected at [**1**].
- Install the lid on the connection tray in reverse order.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 117 Measuring the difference between the static and dynamic gas supply pressures

DANGER OF FATAL ACCIDENT/FIRE
from explosive fumes. All work on gas pipe work and fittings must be carried out by authorized gas technicians.

- After carrying out these activities check the measuring nipples used for leaks using a foaming agent which has been approved for gas leak testing.

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door and remove the casing of the pump group as instructed in section 73.
- Close the gas stop valve as indicated in section 74.
- Open some of the radiator valves.



- Zero the digital pressure gauge.

CAUTION!
Throughout the measuring operation, keep the pressure gauge in the same position (horizontal or vertical) in which it was zeroed.

- Set the pressure gauge to the correct measuring range.
- Loosen the gas connection pressure testing nipple screw [**1**] by 2 turns.
- Connect the pressure gauge to the measuring nipple [**2**].
- Open the gas stop valve as indicated in section 81.
- Switch off all other gas-fired equipment (such as gas heaters, gas cookers and any other boilers, possibly in cascade etc.).
- Check that the static gas supply pressure does not rise slowly for 2 minutes.
- Switch all other gas-fired equipment (such as gas heaters, gas cookers and any other boilers, possibly in cascade etc.) to full-load operation. Do NOT switch the **Logamax plus GB162** on while the measurement is carried out to full-load operation.
- Measure the static gas supply pressure.
- Switch on the power supply to the heating system, see section 79.
- Put the boiler in flue gas test mode as indicated in section 20.
- Wait for 1 minute until the boiler is running at full load.
- Measure the **dynamic** gas supply pressure.
- Check the difference between the **static** and **dynamic** gas supply pressures. The maximum difference between the static gas supply pressure and the dynamic gas supply pressure allowed is:
  - for **natural gas** Δ 2.0 inch W.C. (Δ 5.0 mbar) between the minimum dynamic gas supply pressure of 5 inch W.C. (12.4 mbar).
  - for **LPG** Δ 8.0 inch W.C. (Δ 19.9 mbar) between the minimum dynamic gas supply pressure of minimum 8 inch W.C. (19.9 mbar).

  If the difference between the static and dynamic gas supply pressures is too much, this indicates that the dynamic gas supply pressure is not OK.

Statically measured [1] gas supply pressure	Natural gas inch W.C. (mbar)	LPG inch W.C. (mbar)
Min.	5 (12.4)	8 (19.9)
Nom.	8 (19.9)	11 (27.4)
Max.	10.5 (26.1)	13 (32.3)

1. Measured statically perpendular to flow at full load

- Switch off the power supply to the heating system, see section 72.
- Close the gas stop valve as indicated in section 74.
- Remove the pressure gauge.
- Tighten the gas connection pressure testing nipple screw.
- Open the gas stop valve as indicated in section 81.
- Check the gas connection pressure testing nipple for leaks using a foaming agent which has been approved for gas leak testing.

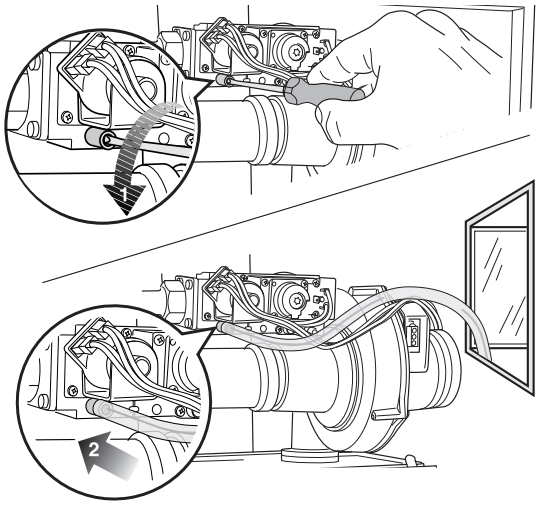
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 118 Bleeding the gas supply pipe

DANGER OF FATAL ACCIDENT/FIRE
from explosive fumes.
All work on gas pipe work and fittings must be carried out by authorized gas technicians.

- After carrying out these activities check the measuring nipples used for leaks using a foaming agent which has been approved for gas leak testing.

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door and remove the casing of the pump group as instructed in section 73.
- Close the gas stop valve as indicated in section 74.



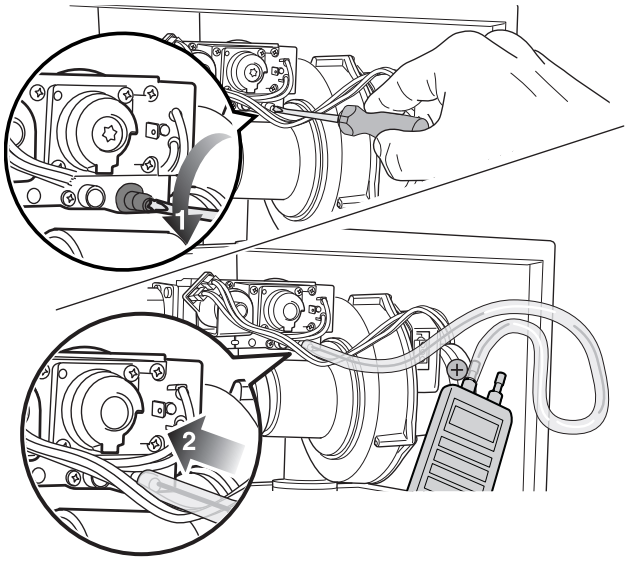
- Loosen the gas connection pressure testing nipple screw [**1**] by two turns.
- Connect a long hose [**2**] to the gas connection pressure testing nipple and lay this hose so that it ends up outside the building.
- Open the gas stop valve as instructed in section 81 until no further air escapes from the hose.
- Close the gas stop valve as indicated in section 74.
- Remove the hose from the gas connection pressure testing nipple.
- Tighten the gas connection pressure testing nipple screw.
- Open the gas stop valve as indicated in section 81.
- Check the gas connection pressure testing nipple for leaks using a foaming agent which has been approved for gas leak testing.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 119 Measuring and adjusting the gas/air ratio

DANGER OF FATAL ACCIDENT/FIRE
from explosive fumes.
All work on gas pipe work and fittings must be carried out by authorized gas technicians.

- Check the measuring nipples used for leaks using a foaming agent which has been approved for gas leak testing.

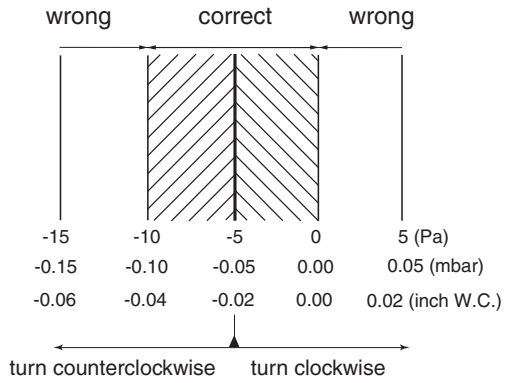
- Switch off the power supply to the heating system, see section 72.
- Open the boiler door and remove the casing of the pump group as instructed in section 73.
- Close the gas stop valve as indicated in section 74.
- Open some of the radiator valves.



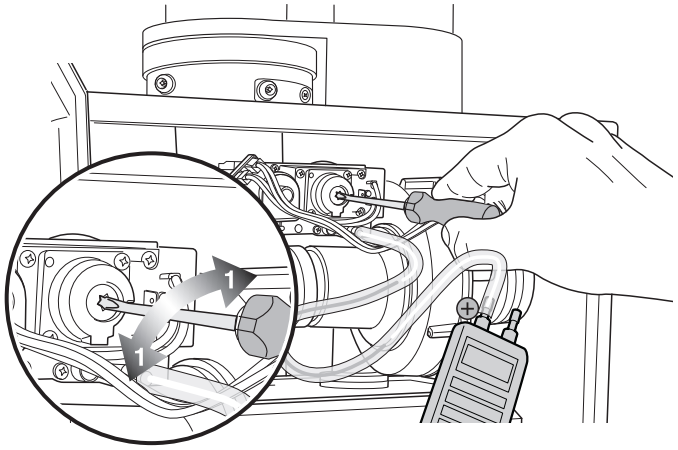
- Zero the digital pressure gauge.

CAUTION!
Throughout the measuring operation, keep the pressure gauge in the same position (horizontal or vertical) in which it was zeroed.

- Loosen the gas/air ratio testing nipple screw [**1**] by two turns.
- Connect the pressure gauge to the gas/air ratio testing nipple [**2**].
- Open the gas stop valve as indicated in section 81.
- Switch on the power supply to the heating system, see section 79.
- Put the boiler in service mode, see section 21.
- During service mode, adjust the capacity to L25. = 25 % with an 80-kW boiler or L20. = 20 % with a 100-kW boiler.
- Briefly wait for the boiler to modulate down to minimum capacity.



- Check the gas/air ratio. The gas/air ratio is measured as a pressure difference between the pressure in the gas valve and the ambient pressure. This pressure difference must be between -0.04 – 0 inch W.C. As a result, the nominal pressure difference is -0.02 inch W.C.



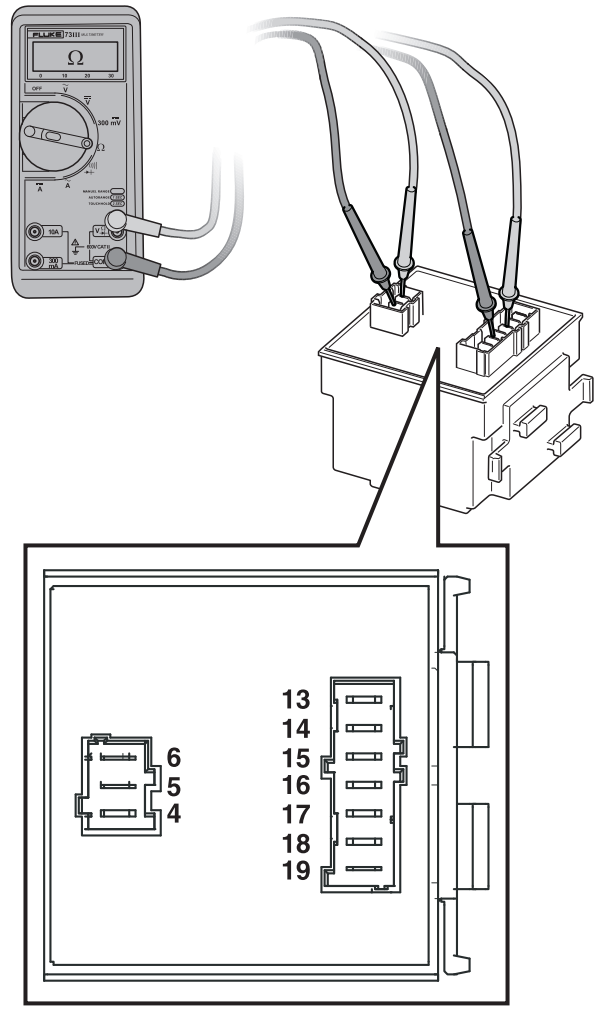
- If necessary, adjust the gas/air ratio using the set screw [**1**].

NOTE:
The set screw is located behind the cover.

- Switch off the power supply to the heating system, see section 72.
- Close the gas stop valve as indicated in section 74.
- Remove the pressure gauge.
- Tighten the gas/air ratio testing nipple screw.
- Open the gas stop valve as indicated in section 81.
- Switch on the power supply to the heating system, see section 79.
- Put the boiler in flue gas test mode as indicated in section 20.
- Wait for the burner to ignite.
- Check the gas/air ratio testing nipple for leaks using a foaming agent which has been approved for gas leak testing.
- Put the boiler in flue gas test mode as indicated in section 20.
- Close the boiler door as instructed in section 77.

section 120 Checking the transformer; internal electrical resistance

- Disassemble the transformer as indicated in section 122.



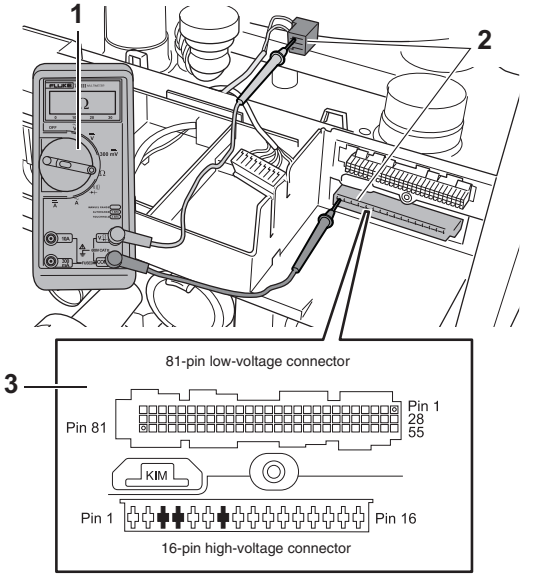
- Set the multimeter to "Measure resistance".
- Check the resistance of the different coils of the transformer. The resistance measured must not be zero or infinite (∞).

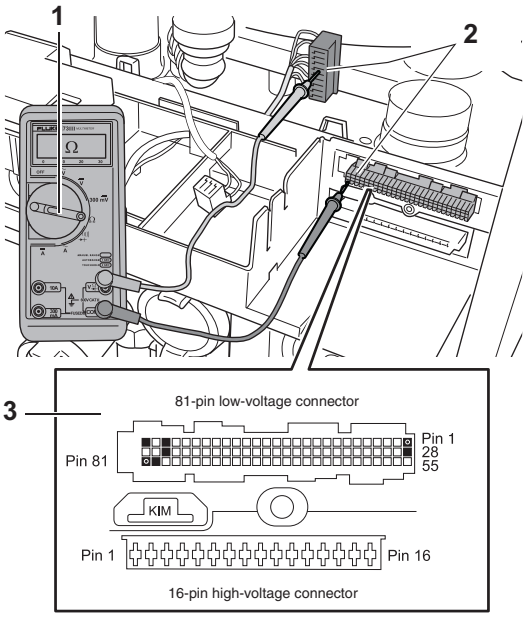
Contact	Resistance [Ω]
4 - 6	0 < x < ∞
4 - 5	0 < x < ∞
13 - 14	0 < x < ∞
14 - 15	0 < x < ∞
16 - 17	0 < x < ∞
18 - 19	0 < x < ∞

- Install the transformer in reverse order.

section 121 Checking the transformer; power supply cord and low-voltage cord

- Disassemble the transformer as indicated in section 122.



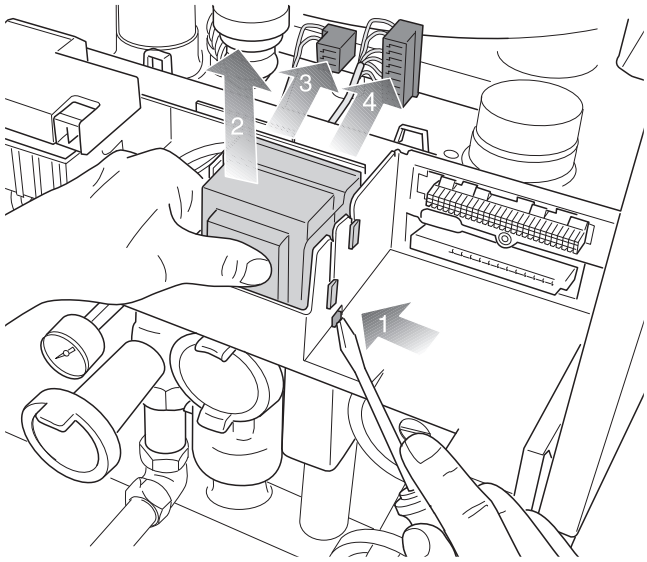


- Set the multimeter to "Measure resistance" [**1**].
- Check the power supply cord and the low-voltage cord for breaks. The electrical resistance measured separately for every wire must be approx. 0 Ω [**2**]. Measure between the plug and the black contacts (high-voltage connector pins 3, 4, 7 and low-voltage connector pins 1, 25, 27, 28, 52, 80, 81) on the UBA 3 mounting base [**3**].
- Check the power supply cord and the low-voltage cord for internal short circuiting. The electrical resistance, measured between two random wires, must be infinite.
- Measure the electrical resistance over the power supply cord and the low-voltage cord to ground. The electrical resistance must be infinite for every individual wire.
- Install the transformer in reverse order.

section 122 Replace transformer

DANGER OF FATAL ACCIDENT
due to electric shock!

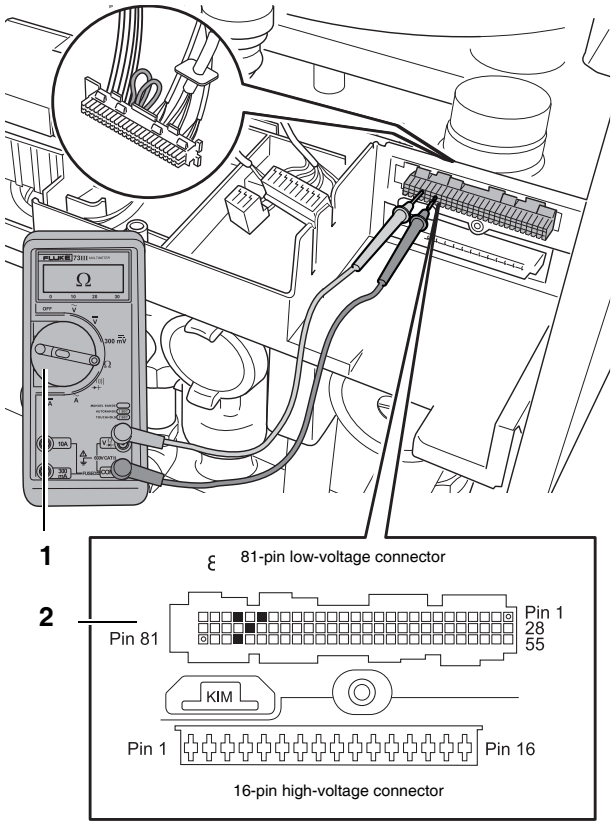
- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.
- Remove the UBA 3 as instructed in section 82.
- Remove the cover from the connection tray, see section 114.



- While depressing the lock using a screwdriver [**1**] pull the transformer upwards [**2**].
- Remove both the power supply plug [**3**] and the low-voltage plug [**4**].
- Install the new transformer in reverse order.
- Install the lid on the connection tray in reverse order.
- Install the UBA 3 in reverse order of removal.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 123 Checking the wire harness; connections

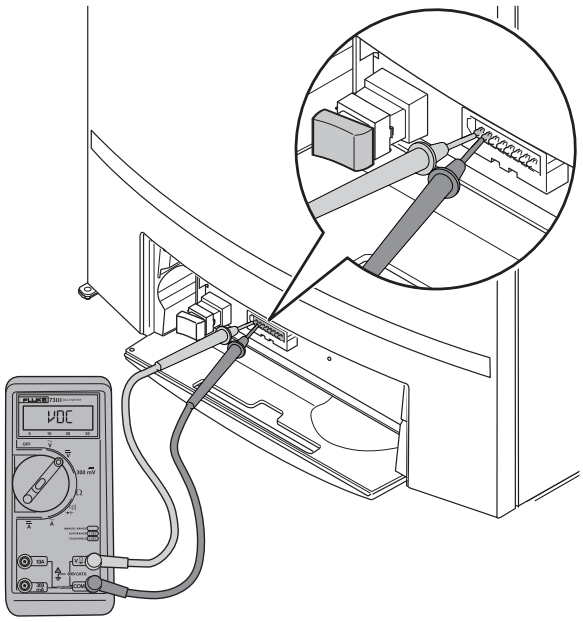
- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.
- Remove the UBA 3 as instructed in section 82.
- Remove the cover from the connection tray, see section 114.



- Set the multimeter to "Measure resistance" [**1**].
- Check the electrical resistance of the connection between the two black contacts (low-voltage connector pins 22 and 24) on the UBA 3 mounting base [**2**]. The electrical resistance of this connection must be approximately 0 Ω [**2**].
- Check the electrical resistance of the connection between the two black contacts (low-voltage connector pins 50 and 78) on the UBA 3 mounting base [**2**]. The electrical resistance of this connection must be approximately 0 Ω [**2**].
- Install the lid on the connection tray in reverse order.
- Install the UBA 3 in reverse order of removal.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 124 Checking the cotrol panel; supply voltage

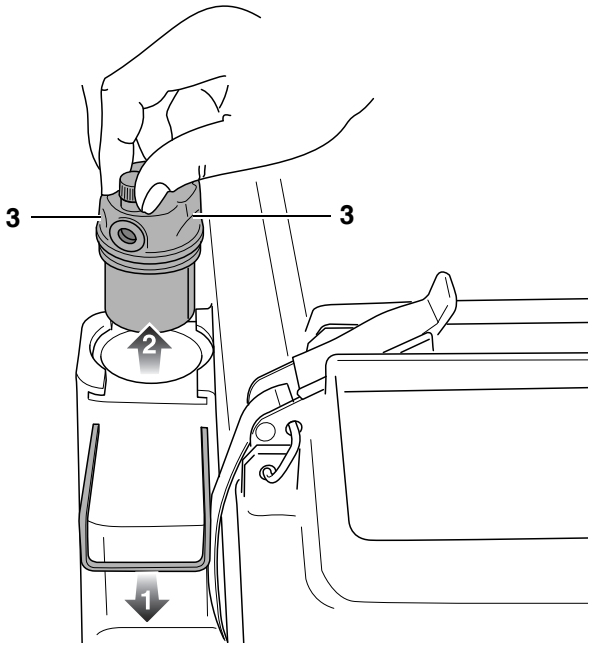
- Open the cover of the BC10 on the front of the boiler as instructed in section 69.
- Remove the BC10 by depressing the lock on the left-hand side.
- Switch on the power supply to the heating system, see section 79.
- Put the main power switch on the control panel in position "1" (On), see section 80.



- Set the multimeter to "Measure DC voltage".
- Check that there is between 7.8 and 15.2 VDC on both left-hand contacts of the connector on the bottom plate of the BC10.
- Install the BC10 in reverse order.
- Close the cover of the BC10 on the front of the boiler in reverse order.

section 125 Replacing the automatic air purging system

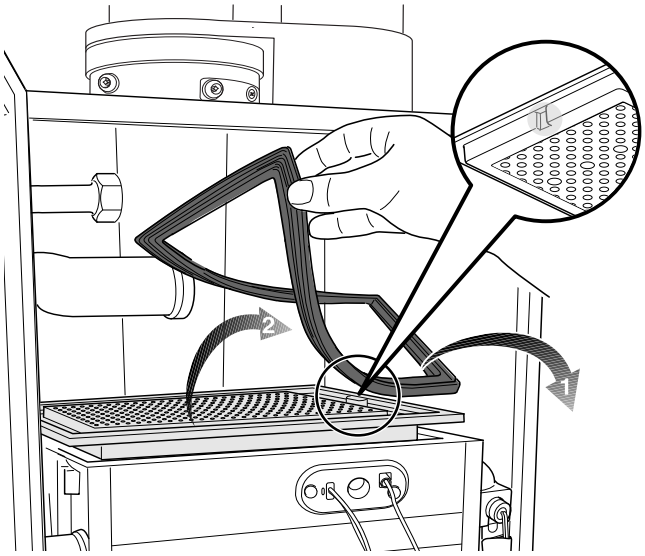
- Drain the boiler as indicated in section 75.
- Open the boiler door as instructed in section 73.



- Pull the clamp spring forwards [**1**] and remove the automatic air purging system [**2**].
- **Note:** The top of the automatic air purging system has two cut-outs [**3**].
  Install the new automatic air purging system so that the clamp spring engages in both cut-outs.
- Fill and purge the heating system and put the boiler into operation, see section 78.

section 126 Replacing/cleaning the burner

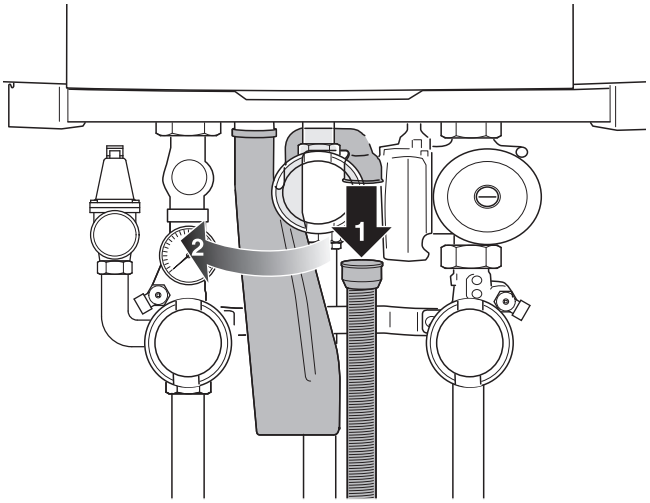
- Disassemble the gas/air unit including the burner cover as indicated in section 86.



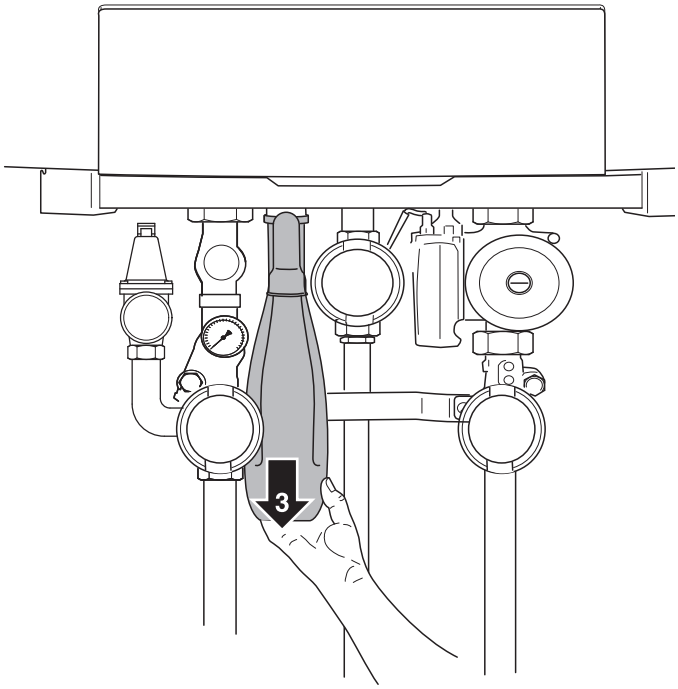
- Remove the burner gasket [**1**] and replace it if necessary.
- Remove the burner [**2**].
- Check the burner and the distributor plate for dirt and cracks and clean or replace the burner.
- Check the burner gasket for signs of ageing.
- Replace the burner gasket if necessary.
- Install the burner and the burner cover in reverse order.
- Open the gas stop valve and put the boiler into chimney sweep operation as instructed in section 81.
- Check all couplings and locations in the gas train -which have been disconnected to install the burner- for leaks. Use a foaming agent which has been approved for gas leak testing.
- If a gas leak is found: switch off the power supply to the heating system, see section 72, close the gas stop valve as indicated in section 74 and deal with the cause of the gas leak.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.
- Open the gas stop valve as indicated in section 81.

section 127 Replacing/cleaning the siphon

- Switch off the power supply to the heating system, see section 72.
- Remove the casing of the pump group as indicated in section 73.



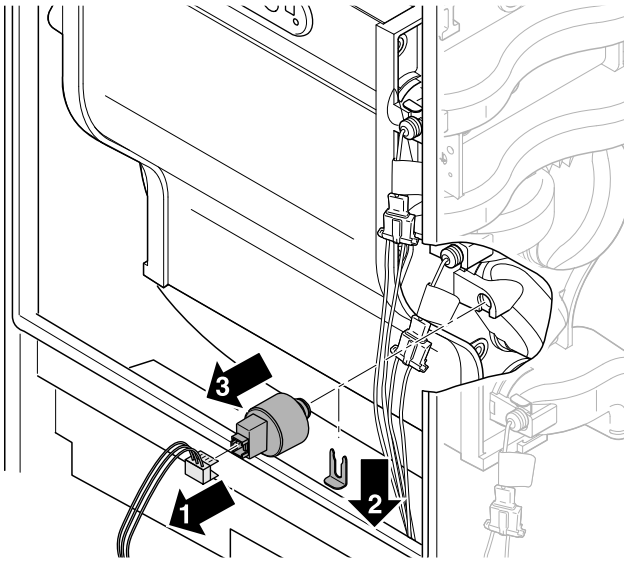
- Remove the rubber sleeve including the ribbed pipe [**1**].
- Turn the siphon a quarter turn in a counterclockwise direction [**2**].



- Remove the siphon by pulling it downwards [**3**].
- Clean the siphon if necessary.
- Install the new or cleaned siphon.
- Install the casing of the pump group in reverse order of removal.
- Switch on the power supply to the heating system, see section 79.

section 128 Checking/replacing the pressure sensor; pollution

- While carrying out these activities check all sealing rings and gaskets for damage, deformation and signs of aging and replace if required.
- Take the boiler out of operation and drain the boiler as instructed in section 75.



- Disconnect the plug of the pressure sensor [**1**].
- Remove the clamp spring [**2**].
- Remove the pressure sensor [**3**].
- Check the pressure sensor for dirt and clean it if necessary.
- Install the new or cleaned pressure sensor in reverse order.
- Fill and purge the heating system and put the boiler into operation, see section 78.

section 129 Replacing/cleaning the heat exchanger

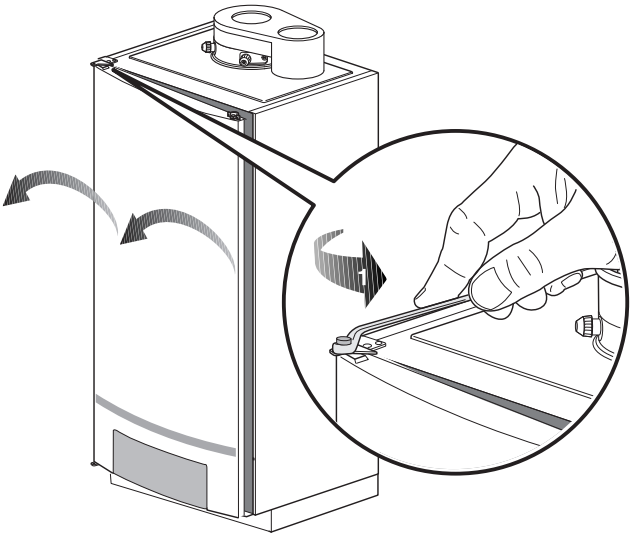
DANGER OF FATAL ACCIDENT
due to electric shock!

DANGER OF FATAL ACCIDENT/FIRE
from explosive fumes.
All work on gas pipe work and fittings must be carried out by authorized gas technicians.

- While carrying out these activities check all sealing rings and gaskets for damage, deformation and signs of ageing and replace if required.
- After carrying out these activities, check the system for leaks on the gas side and/or the flue gas side.

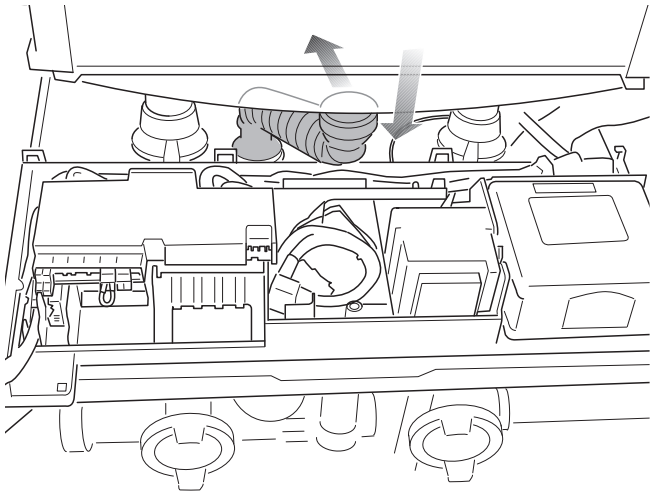
DAMAGE TO THE DEVICE
due to damage to the coating.

- The heat exchanger has been coated. Avoid damaging this coating. Do not use steel-bristle brushes to clean the various parts and components.

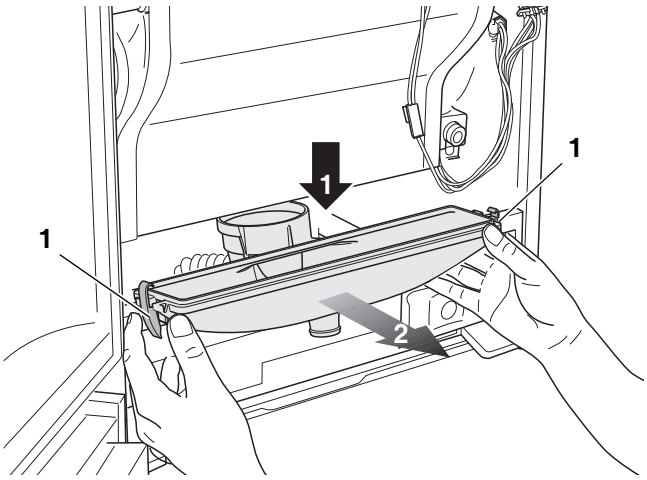


USER INSTRUCTION
If the boiler door cannot be opened all the way, making it difficult to remove the heat exchanger if required, you may remove the door.

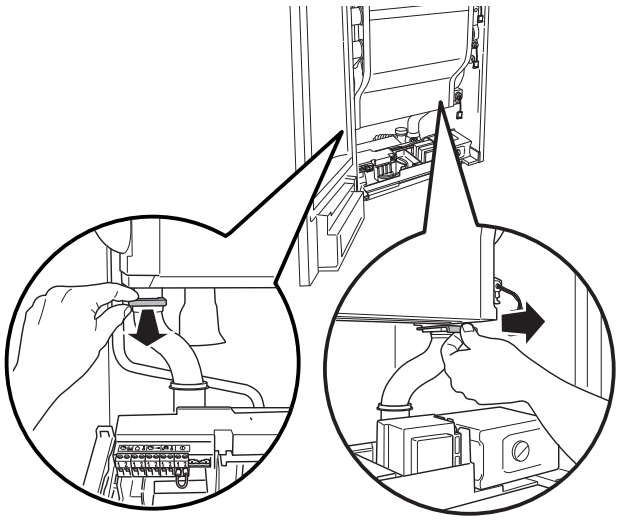
- Suspend the BC10 from the radiator as instructed in section 68.
- Unscrew the hinge pin of the hinge [**1**] and remove it including its washer.
- Pull the door upwards a bit and then pull it out of the hinge. Carefully put the door down.
- See the Installation and servicing instructions of the boiler for detailed maintenance information.
- Switch off the power supply to the heating system, see section 72.
- Open the boiler door and remove the casing of the pump group as instructed in section 73.
- Close the gas stop valve and service valves as indicated in section 74.
- Disassemble the burner including the gas/air unit including as indicated in section 126.
- Remove the glow ignitor and the ionization electrode as indicated in section 103.
- Remove the supply, safety and return sensors as instructed in section 95.
- Remove the pressure sensor as instructed in section 128.
- Remove the automatic air purging system as instructed in section 125.



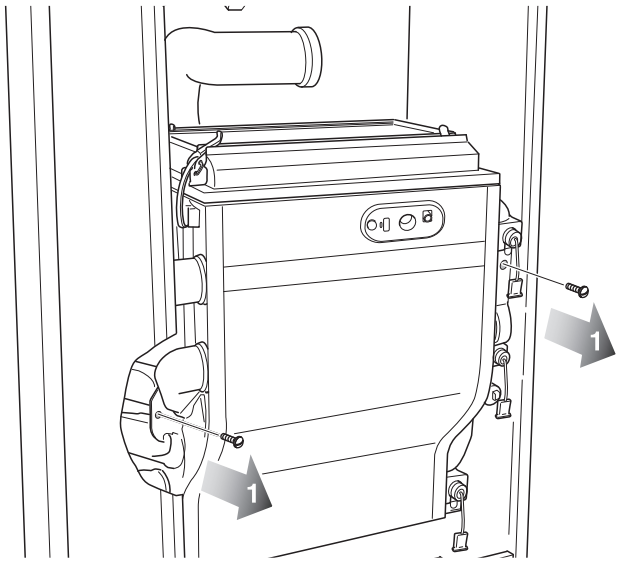
- Pull the condensate draining pipe down and bend it backwards.



- Open the 2 snap closures [**1**] on the left and the right and remove the condensate water tank.



- Remove both clamp springs.
- Remove both the ground lead of the heat exchanger and the ground lead of the ionization circuit as instructed in section 108.



- Loosen both mounting screws [**1**].

- Remove the heat exchanger.
- Install the new heat exchanger and all other parts in reverse order.
- Fill and purge the heating system, see section 78.
- Open the gas stop valve as indicated in section 81.
- Close the boiler door and install the casing of the pump group in reverse order of removal.
- Switch on the power supply to the heating system, see section 79.

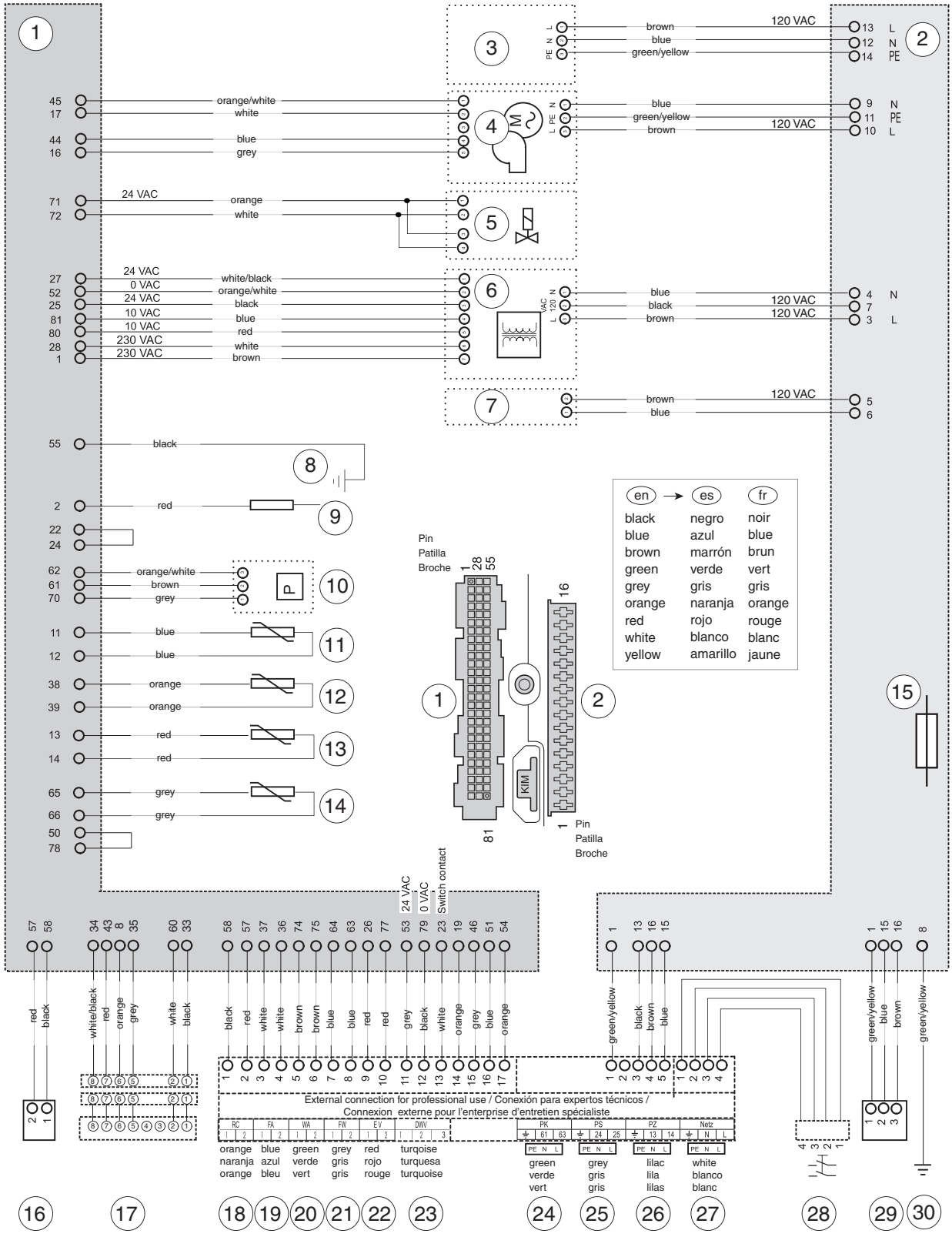
section 130 Replacing the UBA 3

DANGER OF FATAL ACCIDENT
due to electric shock!

- Switch off the power supply to the heating system, see section 72.
- Open the boiler door as instructed in section 73.
- Remove the cover from the connection tray, see section 114.
- Remove the UBA 3 as instructed in section 82.
- Install the new UBA 3 in reverse order of removal.
- Install the lid on the connection tray in reverse order.
- Close the boiler door as instructed in section 77.
- Switch on the power supply to the heating system, see section 79.

section 131 Electrical wiring diagram

Logamax plus GB162 -80 kW/-100 kW



IMPORTANT
The wires in this mains lead are colored in accordance with the following code: **GREEN AND YELLOW - EARTH ; BLUE - NEUTRAL ; BROWN - LIVE**
As the colors of the wires in the mains lead of of the appliance may not correspond with the colored markings identifying the terminals in your connector proceed as follows:
The wire colored green and yellow must be connected to the terminal on the connector marked with the letter E or by the ground symbol ⏚ or colored green or green-and-yellow. The wire colored brown must be connected to the terminal marked with the letter L or colored red. The wire colored blue must be connected to the terminal marked with the letter N or colored black.
WARNING
THIS APPLIANCE MUST BE GROUNDED
Ensure that your appliance is connected correctly - if you are in any doubt consult a qualified electrician. For location of individual components, see service section and the exploded views in this manual.

section 132 Legend of electrical wiring diagram

1: 81-pole connector (AC 0, 10, 24 and 230 V)
2: 16-pole connector (AC 120 V)
3: Connection for pump in connection kit (accessory)
4: Fan
5: Gas valve
6: Transformer
7: Glow ignitor
8: Earth
9: Ionization
10: Pressure sensor
11: Return sensor
12: Safety-temperature sensor
13: Supply sensor
14: Flue gas sensor
15: Fuse (5 amp. FAST, sand filled)
16: BUS function modules
17: Connector for BC10 Basic Controller
18: Room controller RC and EMS bus
19: Outdoor temperature sensor
20: On/off temperature controller (potential free)
21: DHW sensor
22: External switch contact (potential free, e.g. floor heating)
23: External three-way valve
24: Boiler pump (120 VAC, max. 100 W)
25: DHW pump (pump 120 VAC, max. 100 W)
26: DHW re-circulation pump (pump 120 VAC, max. 100 W)
27: Main power connection 120 V 60 Hz, max. permissible 5 A
28: Mains switch
29: 120 VAC function module
30: Ground

section 133 Power rating

Display indication on the control panel [%]	Power rating at 104/86 °F [kW]	
	Logamax plus GB162-80 kW	Logamax plus GB162-100 kW
L20	–	20.0
L25	20.0	25.0
L30	24.3	29.9
L35	28.6	34.9
L40	32.9	39.9
L45	37.2	44.8
L50	41.5	49.8
L55	45.8	54.8
L60	50.1	59.8
L65	54.4	64.7
L70	58.7	69.7
L75	63.0	74.7
L80	67.3	79.6
L85	71.6	84.6
L90	75.9	89.6
L95	80.2	94.5
L--	84.5	99.5

section 134 Sensor resistance readings

Temperature in °F	Resistance in Ω	Temperature in °F	Resistance in Ω
32	29,490		
41	23,462	176	1,458
50	18,787	185	1,255
59	15,136	194	1,084
68	12,268	203	940
77	10,000	212	817
86	8,197	221	714
95	6,754	230	626
104	5,594	239	550
113	4,656	248	484
122	3,893	257	428
131	3,271	266	379
140	2,760	275	337
149	2,339	284	300
158	1,990	293	268
167	1,700	302	239

section 135 Technical Specifications of GB162-boilers at sea level (0-4,000 ft)

General specifications	unit	GB162-80 (NG)	GB162-80 (LP)	GB162-100 (NG)	GB162-100 (LP)
Gas category		Natural gas	Propane	Natural gas	Propane
Rated thermal load	**btu/h**	72,000 - 290,000	62,000 - 270,000	72,000 - 333,000	62,000 - 315,000
Rated heating capacity, heating curve 176/140 °F (80/60 °C)	**btu/h**	64,100 - 255,200	55,200 - 237,600	64,100 - 293,000	55,200 - 277,200
Rated heating capacity, heating curve 122/86 °F (50/30 °C)	**btu/h**	71,300 - 281,300	61,400 - 261,900	71,300 - 326,300	61,400 - 308,700
Boiler efficiency at max. capacity, heating curve 176/140 °F (80/60 °C)	**%**	88		88	
Boiler efficiency at max. capacity, heating curve 122/86 °F (50/30 °C)	**%**	97		98	
CSA Output	**btu/h**	261,000	243,000	295,000	279,000
De-ration altitudes 2,000 - 4,000 ft	**% / 1,000 ft**	2.3	2.2	2.1	2.0
AFUE at 80/180°F (27/82 °C)		93.8	93.9	n/a	n/a
BTS 2000 at 80/180°F (27/82 °C) part. load		n/a	n/a	96.1	96.1
BTS 2000 at 80/180°F (27/82 °C) full load		n/a	n/a	90.8	90.8
Heating					
Maximum flow temperature	**°F (°C)**	190 (88)			
Maximum working pressure (boiler)	**PSI (bar)**	50 (3.6)			
Minimum water circulation volume	**Gal/h (l/h)**	0			
Supply temperature	**°F (°C)**	86-190 (30-88), can be set on the control panel			
Resistance at ΔT = 38 °F (20 °C)	**psi (mbar)**	3.26 (225)		4.57 (315)	
Heating circuit volume of heat exchanger	**Gal (L)**	1.3 (5.0)			
Pipe connections boiler, without pump group					
Gas connection	**in**	Rp1“			
Heating water connection	**in**	G1½” union nut with female thread enclosed			
Condensate connection	**in (mm)**	Ø 1¼” (32 mm)			
Flue gas values					
Condensate quantity at 104/86 °F (40/30 °C)	**Gal/h (L/h)**	2.4 (9.0)		2.85 (10.8)	
pH value of condensate	**pH**	approx. 4.1			
Flue gas mass flow rate, full load	**g/s**	35.3		44.9	
Flue gas temperature 176/140 °F (80/60 °C), full load	**°F (°C)**	153 (67)	149 (65)	169 (76)	165 (63)
Flue gas temperature 176/140 °F (80/60 °C), partial load	**°F (°C)**	142 (61)	136 (58)	142 (61)	136 (58)
Flue gas temperature 122/86 °F (50/30 °C), full load	**°F (°C)**	118 (48)	114 (46)	124 (51)	120 (49)
Flue gas temperature 122/86 °F (50/30 °C), partial load	**°F (°C)**	93 (34)	88 (31)	93 (34)	88 (31)
CO_2 content at full load	**%**	9.3	9,6	9.4	9,7
Free fan feed pressure	**Inch w.c. (Pa)**	0.602 (150)		0.883 (220)	
Flue gas connection					
Ø flue gas system, room-air dependent	**in (mm)**	Ø 4” (100 mm)			
Ø flue gas system, room-air independent	**in (mm)**	Ø 4” (100 mm) / 4” (100 mm) parallel			

section 135 Technical Specifications of GB162-boilers at sea level (0-4,000 ft) (continued)

General specifications	unit	GB162-80 (NG)	GB162-80 (LP)	GB162-100 (NG)	GB162-100 (LP)
Electrical data					
Mains connection voltage	**VAC, Hz**	120, 60			
Electrical protection rating		IPX4D			
Fuses	**Amp**	5			
Electrical power consumption, full load (without a pump group)	**W**	104		156	
Electrical power consumption, partial load (without a pump group)	**W**	29		29	
Boiler dimensions and weight					
Height × width × depth (with pump group)	**in (mm)**	50.4 x 20.5 x 18.3 (1280 × 520 × 465)			
Weight (without a pump group)	**lb (kg)**	154 (70)			
Other specifications					
Pump group pump		UP 26-99			

Fuels and configurations	Logamax plus GB162-80 kW/100 kW
Type of gas supply	Natural gas **H** (G20, delivery setting), LP-gas (propane, after conversion)
Version	B_{23}, C_{13}, C_{33}, C_{43}, C_{53}, C_{63}, C_{83} depending on room air and independent of room air (Compliance with increased tightness requirements with operation independent of room air).
Gas category according to EN 437	US/CA II_{2H3P} 20, 37 mbar

Thermal power gas boiler	Type of gas supply	Altitude in ft (m)	Gas orifice diameter in mm (inch)	Venturi article number
GB162-80 KW/100 KW	Natural gas	0 - 4,000 (0 - 1,220)	8.40 (0.331)	7746900399
	LPG	0 - 4,000 (0 - 1,220)	4.70 (0.185)	7746900499

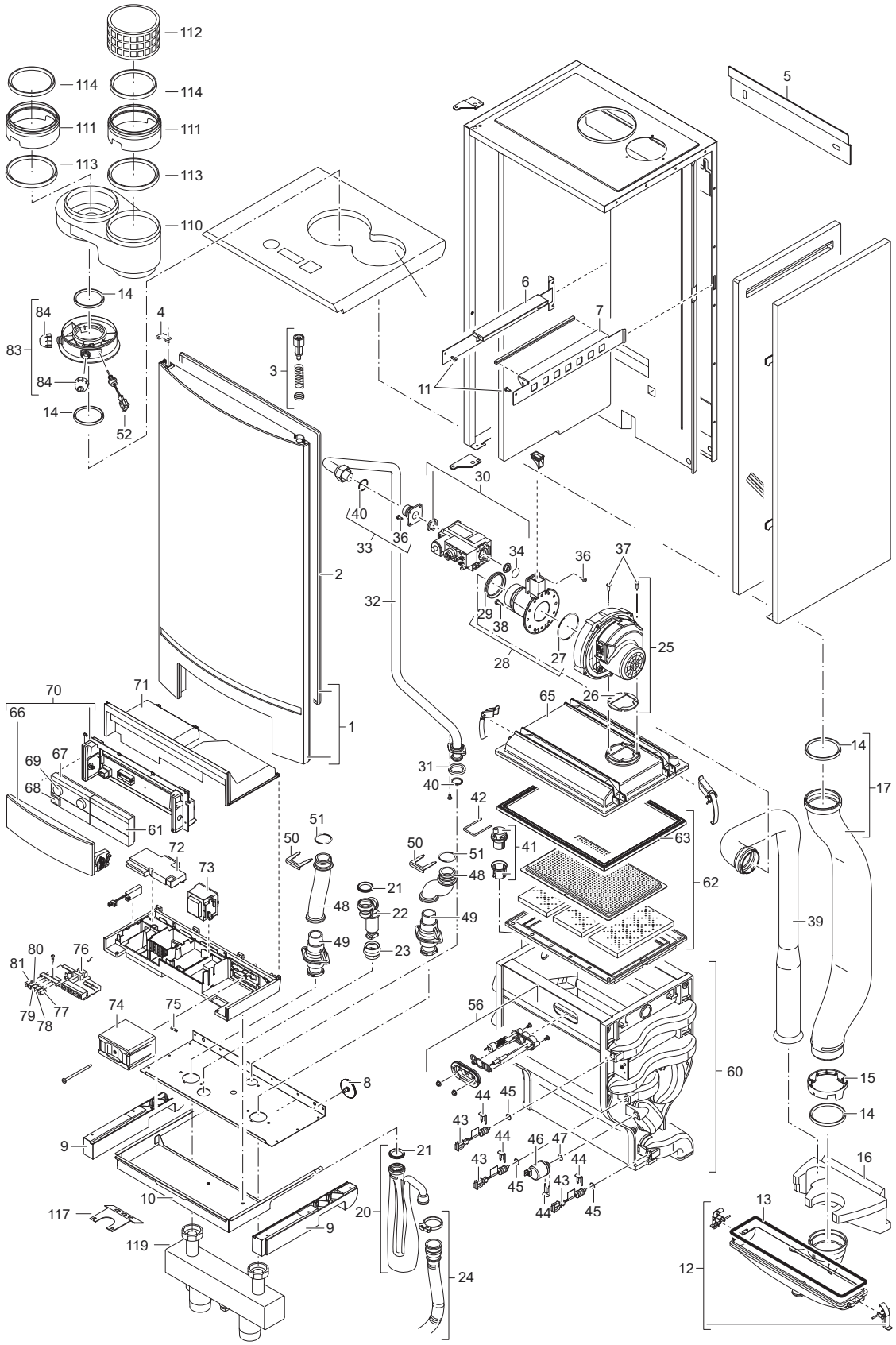
section 136 Spare parts list

Pos.	Description	Product No.
1	Door	7746900396
2	Sealing door	73912
3	Door lock	73911
4	Hinge door	73990
5	Wall mounting bracket	73965
6	Bracket left	73962
7	Bracket right	73963
8	Adjusting foot	73949
9	Transport slide (L + R)	73951
10	Drawer modules	73964
11	Screw 4.2 x 8.5 x (10 pc)	73988
12	Condensate collector	73930
13	Seal condensate collector	7746900152
14	Seal Ø 80 mm (3.2”)	73931
15	Upper side condensate collectors	73934
16	Mounting flue-gas pipe	73907
17	Exhaust pipe	73935
20	Condensate collector	73933
21	Seal condensate collector	73463
22	Drain pipe	73932
23	Sealing bush (white)	73449
24	Condensate drain pipe	73995
25	Fan	7746900382
26	Seal Fan	73920
27	O-ring 70 x 3 (2 pc)	73983
28	Venturi	7746901751
29	Seal Ø 60 mm (2.4”)	73563
30	Gas valve	8718600291
31	Seal 33 x 24 x 3.5 (10 pc)	73479s
32	Gas pipe	7746900397
33	Flange Gas valve	8718600286
34	O-ring (10 pc)	73982
36	Screw M5 x 20 (10 pc)	73572s
37	Screw M5 x 16 (10 pc)	73970
38	Screw M6 x 16 (10 pc)	73971
39	Air inlet pipe	73926
40	Sealing (10 pc)	73969
41	Air vent revision set	73916
42	Clip	73973
43	Sensor NTC	7746900391
44	Clip (3 x 2 pc)	78156s
45	O-ring 9.19 x 2.62 (10 pc)	78175s
46	Pressure sensor	73915
47	O-ring 14 x 1.78 (10 pc)	78234s
48	Return/Supply pipe	73950
49	Connection nipple CH	73080
50	Clip	73974
51	O-ring (10 pc)	73972
52	Flue gas sensor	7746700420
56	Mountig set with sight glass	8718600172
	with glow ignitor	
	with ionization electrode	
60	Heat exchanger	7746900383

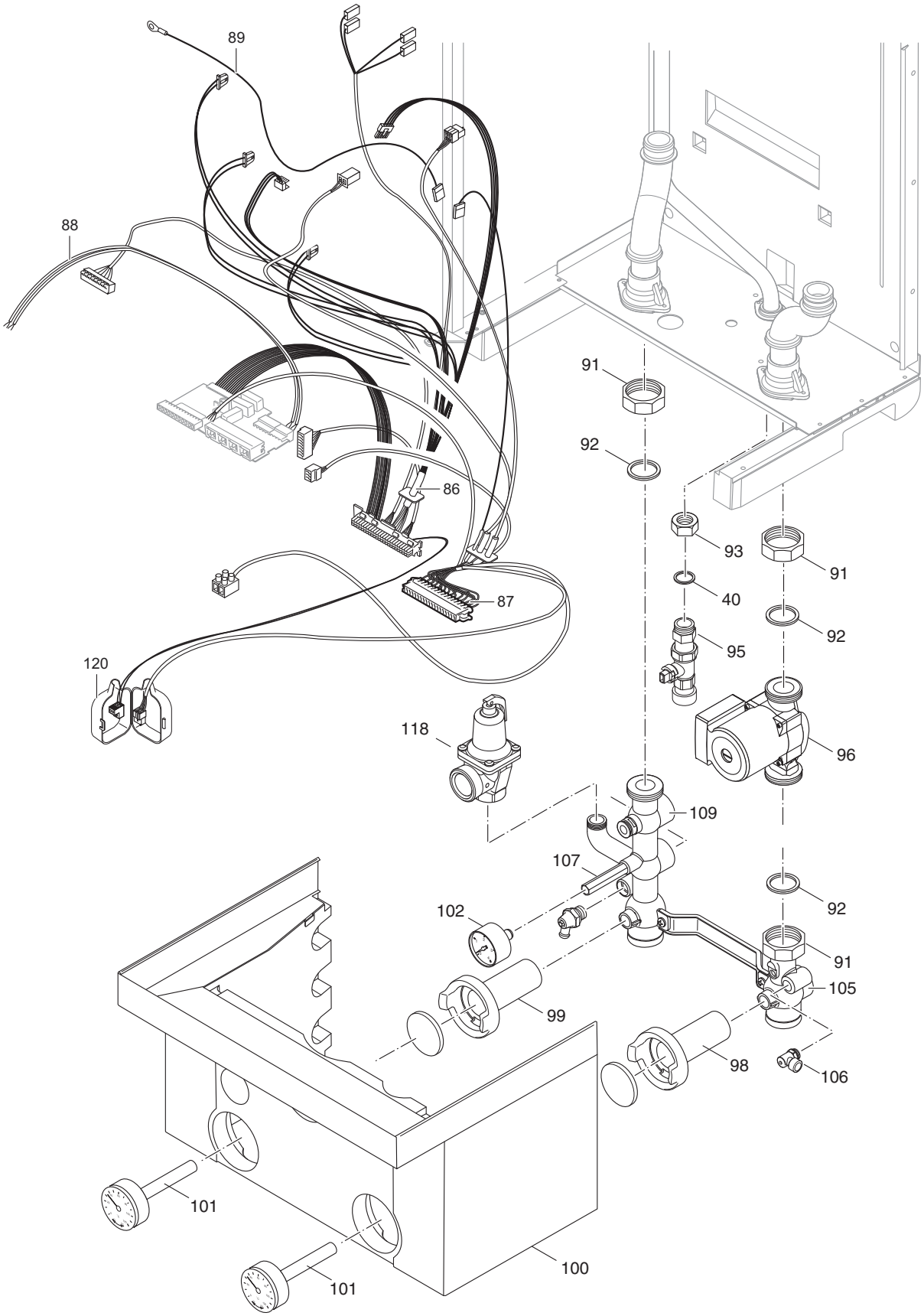
section 137 Spare parts list (continued)

Pos.	Description	Product No.
61	Cover controler BC10	73698
62	Burner	73917
63	Seal Burner	73918
65	Burner box	73919
66	Front connection board	7101490
67	BC10 USA	78186
68	On/Off switch	73660
69	Knob BC10	38724
70	Drawer connection board	7101480
71	Cover control box	73977
72	Cover connection board 120 VAC	73815
73	Transformer	78191
74	UBA 3	8718600083
75	Fuse 5AF (10 pc)	73904s
76	Connection board	73814
77	Electronic connection red	73776
78	Electronic connection grey	73774
79	Electronic connection green	73773
80	Electronic connection blue	73775
81	Electronic connection orange	73777
83	Flue gas adapter	73936
84	Measure nipple cap	73937
86	Cable harness low voltage	7746900392
87	Cable harness high voltage	7746900393
88	Cable harness on/off switch	73946
89	Cable harness earth	73947
91	Union nut 1½" (5 pc)	73481s
92	Sealing (5 pc)	7746700417
93	Nut 1"	73675
95	Gas valve	7746900401
96	Pump UP26-99U	7746900402
98	Lever Ball Valve blue	7746700421
99	Lever Ball Valve red	7746700422
100	Casing	73961
101	Thermometer	7746900404
102	Manometer	73958
105	Valve housing return	74549
106	Air Release Tap	7746900403
107	Connection pressure gauge	73081
108	Drain pipe	7101410
109	Valve housing supply	7746900406
110	Adapter parallel 4”	7746900384
111	Adapter insert 4”	7746900385
112	Open venting insert	7746900386
113	Lipring 114	7746900387
114	Lipring 103	7746900388
117	Strain relief bracket	7746900398
118	Safety valve ASME	7746900405
119	Low loss header	7746900400
120	Plug protector	73948
–	BCM 1100 – 100 kW (0-4,000 ft)	7746900394
–	BCM 1101 – 80 kW (0-4,000 ft)	7746900395
–	Screw 6.3 x 19 (10 pc)	73986

section 138 Exploded view Logamax plus GB162-80 kW/100 kW



section 139 Exploded view pump group Logamax plus GB162-80 kW/100 kW



section 140 Index

B

Bleeding the gas supply pipe 84

C

Checking an external switch contact 83
Checking and/or replacing the fan unit 63
Checking the cable harness – connections 87
Checking the control panel – supply voltage 87
Checking the fan unit – operation 120 VAC 61
Checking the fan unit – power supply cord (120 VAC) 62
Checking the fan unit – tacho cable 62
Checking the flue gas sensor 72
Checking the flue gas sensor – cable 73
Checking the gas valve – activation 79
Checking the gas valve – electrical resistance of power supply cord 80
Checking the gas valve – internal electrical resistance 80
Checking the gas valve – power supply plug 79
Checking the glow ignitor – activation 74
Checking the glow ignitor – power supply cord 75
Checking the glow ignitor – resistance 75
Checking the ionization circuit – ground lead 79
Checking the ionization electrode 78
Checking the ionization electrode – cable 78
Checking the ionization electrode – short circuit 77
Checking the ON/OFF controller 82
Checking the pump – activation 65
Checking the pump – mechanical obstruction 64
Checking the pump – pollution 67
Checking the pump – power supply cord 65
Checking the pump – tacho cable 66
Checking the RC regulator 82
Checking the supply, safety, return and DHW temperature sensors 68
Checking the supply, safety, return and DHW temperature sensors – cables 69
Checking the transformer – internal electrical resistance 85
Checking the transformer – power supply cord and low-voltage cord 86
Checking/replacing fuses 61
Checking/replacing the pressure sensor – pollution 89

D

Draining the system 57

E

Electrical wiring diagram 92

F

Filling the system and bleeding it of air 58
Flow temperature, maximum 94
Flue gas connection 94
Front protection 8

H

Heat exchanger 3, 94

I

Initial startup 60

M

Measure the ionization current 76
Measuring and adjusting the gas/air ratio 84
Measuring the gas supply pressures – static and dynamic 83

P

Pump run-over time 8
Pump test 8

R

Replace transformer 86
Replacing the automatic air purging system 88
Replacing the DHW temperature sensor 72
Replacing the feed, safety and return sensors 71
Replacing the flue gas sensor 74
Replacing the gas valve 81
Replacing the ignition unit 76
Replacing the pump 67
Replacing the UBA 3 91
Replacing/cleaning the burner 88
Replacing/cleaning the heat exchanger 89
Replacing/cleaning the siphon 89

T

Technical specifications 94

V

Venturi 95

W

Working pressure 94

United States and Canada

Bosch Thermotechnology Corp.
50 Wentworth Avenue
Londonderry, NH 03053
Tel. 603-552-1100
Fax 603-965-7581
www.bosch-climate.us
U.S.A.

Products manufactured by
Bosch Thermotechnik GmbH
Junkersstrasse 20-24
D-73249 Wernau
www.bosch-thermotechnology.com

Bosch Thermotechnology Corp. reserves the right to make changes without notice due to continuing engineering and technological advances.

6720614965 0005

Buderus